DEVELOPMENT OF A CULTURALLY APPROPRIATE PROCESS FOR ASSESSING DISTANCE LEARNING READINESS IN LATIN AMERICA

A Dissertation

by

PATRICIA VILLALOBOS PEÑALOSA

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2007

Major Subject: Agricultural Education

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ABSTRACT

Development of a Culturally Appropriate Process for Assessing Distance Learning Readiness in Latin America. (May 2007)

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The purpose of this study was to develop an instrument for assessing distance learning readiness of institutions in Latin America for international projects of food and agriculture with higher education institutions in the U.S.

The data collection followed two approaches: a quantitative, which was processed statistically, including mean (percentage), mode and cross-tabulation, and a qualitative, through semi-structured interviews.

The population of this research was animal biotechnology institutions in Latin American countries, Spanish speaking, partners with the major funding organizations in the U.S., with Web pages on the Internet. Population included 17 countries with N=150, a random sample of n=83 for the quantitative analysis and n=20 for the qualitative approach.

The instrument was developed by the researcher. Items were based on readiness surveys used widely in the U.S., and founded in two culture theories: Bank's (2001) cultural elements and Hosfstede's (1984) cultural dimensions. Using Bank's theory it

was concluded that English proficiency was considered an essential tool for research. Interviews exposed that researchers were aware of nonverbal communication differences between Latinos and Americans. Cultural cognitiveness showed to be exposed when researchers were confronted with another culture. The perspective of distance education showed to be considered different from face to face education. There was an appropriate perception of the need, ownership, and use of computer technologies and Internet accessibility with fast connections. Researchers perceived computer technology equipment as a measurement of the quality of their institution.

Using Hofstede's (1984) dimensions it was concluded that Latin American countries were considered to have high power distance on four of the six items assessed; had strong uncertainty avoidance with four of the six items assessed, where a collectivist society, with five items out of six. Interviews determined that a masculine dimension was predominant in the study.

Assessment of technology involved: Internet, technological resources, computer proficiency, distance education and instructional design experience. Results of this assessment showed that technology must be measured through a cultural perspective to achieve accurate responses because people express and understand through their mental constructs which are tainted with their cultural experiences and their perception of life, work, academics, and society.

DEDICATION

I would like to dedicate this work to my husband, Bruno Ortega for being my support, my friend, my academic companion and my great love, for walking and sharing together this adventure.

To my daughters, Maria Fernanda, Luisa and Liliana, because they are the love and the engine of my life; because they supported a student mom, a distant mom. For all those times when I said “Not now, I am studying.” Especially to Marifer and Luisa who stood by me even though they wanted their precious Mexico back.

To my Mom, Socorro Peñalosa, for all her love and encouragement. *Thank you Mom, I love you*.

To my Dad, Rafael Villalobos, for being the path to follow and my admiration. *I love you Dad.*

To my sister, Liliana for her love; to my brothers, Mario, for setting up the example, Rafael for his affection, and Pietro for his love.

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I would like to acknowledge my sponsor, the Universidad Autónoma de Tlaxcala for their support, and without whom my dream of pursuing graduate studies at Texas A&M would have been impossible.

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Finally, I also want to thank all the Latin American researchers who enthusiastically participated in my study, because without their contribution this work would not have being possible.

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CHAPTER I

INTRODUCTION

During the past few decades, distance learning has become an increasingly popular and widespread mode of delivery. One use of distance delivery is to facilitate international projects between the U.S. and other countries. For example, projects funded by agencies such as the United States Agency for International Development (USAID), the Higher Education for Development (HED), National Science Foundation (NSF), United States Department of Agriculture (USDA), and the Organization for Economic Co-operation and Development (OECD) promote partnerships using distance education.

In Frydenberg's article (2002) it was stated that distance learning is rapidly becoming the dominant form of delivery in developed countries. It is used in international ventures as part of many projects and agreements. Sheppard et al. (1998) declared that more and more university courses across the U.S. are supported with Web-sites, newsgroups, discussion forums, and joint international projects involving distance education.

Among the regions of U.S. affiliations with international projects in Latin America, many of the projects address issues related to education and regional environmental problems. Animal biotechnology is a field of much interest between developed and developing countries due to its use of living organisms to make or modify products, to improve plants and animals, or to develop microorganisms for specific use. It is rapidly becoming an important development area in the world. New knowledge and

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This dissertation follows the style of *Journal of Agricultural Education.*

methods are constantly emerging and widening the biotechnology divide between developed and developing countries, causing the reduction of developing countries' capacity and opportunity to participate in a global market economy. Through continuous learning and practice, scientists will be able to make objective decisions regarding the benefits and risks of a particular technology to be applied and used, keeping these countries efficiently participating and up-to-date in the globalized world. As a consequence animal biotechnology institutions are prone to the use of innovations in technology of every kind. Thus, distance education is increasingly being used among them.

It has been documented that just making e-learning technology available will have no significant effect on participants' development or productivity (Asia-Pacific Economic Cooperation, 2000). Participants need to be motivated to take advantage of e-learning opportunities. For this to be possible it is necessary to have appropriate programs based on participants' readiness and needs. Assessment should be seen as a partnership activity. University and institution administrators, faculty, students, and researchers need to embark on assessing their readiness for using distance education technology. The primary objective is to determine the conditions and characteristics necessary to start a venture with international animal biotechnology institutions involving distance learning. All participants are stake-holders in discovering and validating what elements work. Faculty, students, researchers and institution administrators alike need this partnership to support their taking thoughtful risks in their research, teaching, learning, and project development (Harvey, 1998). Assessments

become high stakes if used to make decisions about individuals and/or institutions (Maxwell & Clifford, 2004).

The researcher of the present study, worked on a project entitled “Teaching, Researching, and Applying Biotechnology in Mexico,” in a partnership between Texas A&M University and universities from northeast Mexico. This project was supported by a grant from USAID and the Northeast Technical Consortium from Mexico. The project strived to enhance the capacity of six faculty members specializing in animal biotechnology to teach, research, and apply biotechnology to high priority regional problems related to food, agriculture, and the environment. An important aspect of the project was the use of distance learning that included the development and delivery of animal biotechnology training via the Internet. The first step toward the distance education area of the project was the assessment of distance learning readiness of the faculty participants and institution authorities. An instrument was developed based on different assessment tools used in various universities in the U.S., and delivered via e-mail. Findings of the project showed the need for adjustments to the distance education program. When the first group of researchers received the training at Texas A&M University, it was clear that the distance education program was not aligned with the participants’ preparedness or with the Mexican institution realities. A follow-up study concluded that there were many aspects in the assessment, such as cultural practices, communication channels, power structures, work force practices, among some, that did not consider the different contexts of the Latin American animal biotechnology researchers and institutions.

Statement of the Problem

Projects involving distance learning, assessment of readiness of the participants (individuals and institutions) is the first step to determine the feasibility of the project. The existing needs of those participants, the beginning level of the project, and teaching and learning approaches leading to excellence in the development of the project, are some of the components. Lockhart and Lacy (2002) stated that "the need for assessment has become strong in order for higher education administrators and faculty to show that they are delivering quality programs and courses" (p. 98). U.S. higher education institutions have been doing this quite some time for their national and international projects, but assessment of this kind has been done with certain standards that consider only the American context.

Latin America is a region with developing and undeveloped countries that have a complex way of life, work and development, and distinctive cultures. These components create a complicated environment that is ruled by political, cultural, authority, and legal structure systems that define it differently from the U.S. Therefore, it is necessary to use a different approach when assessing readiness of Latin American participants to obtain accurate information vital for the success of any project involving distance leaning. The results of an assessment of this kind are important not only for the purpose of the projects, but also for the Latin American participants to be aware of their own readiness.

Purpose of the Study

The purpose of this study was to develop an instrument for assessing distance learning readiness of institutions in Latin America for international projects of food and agriculture with higher education institutions in the U.S.

Research Questions

The study seeks to answer the following research questions:

1. What contextual factors should be considered when assessing distance learning readiness of Latin American researchers?
2. Is there a difference in how distance learning readiness is assessed between U.S. and Latin American researchers?
3. How can political issues in Latin American institutions be assessed and measured?
4. How can distance education technology infrastructure readiness be measured accurately in Latin America?

Assumptions

One of the assumptions of this study was that the method could be used for any institution in the areas of food, agriculture, natural resources, environmental sciences, and life sciences.

Also it was assumed that the sample of biotechnology institutions in Latin American was representative of the Latin American animal biotechnology community.

The assumption was also made that these institutions are interested and/or involved in international projects with U.S. higher education institutions.

It was assumed that a difference in contexts of communications between the U.S. and Latin America exists.

The animal biotechnology researchers considered in the population of the present study were the subjects assessed and the results will be applied to the animal biotechnology institution they represent.

Limitations

The limitations of the study were:

1. The instrument used in this study was sent to the Latin American researchers, thus it was limited to their own experience and bias.
2. The directory of animal biotechnology researchers created in this study was obtained through the Internet and does not reflect programs not found in the Internet.
3. The effect of the overall concept of privacy in Latin America was not addressed in this study.

Delimitations

The study was delimited to Spanish-speaking Latin American countries that were considered partners by major U.S. organizations that offer grants in higher education. The study focused on animal biotechnology institutions and researchers.

Definition of Terms

Distance Learning Readiness - the degree to which an individual or institution is prepared, willing and has the capacity to participate in the digital world of education (Schlosser & Simonson, 2000).

Distance learning - a system and a process of connecting learners with distributed learning resources.

Learning technology - any learning tool that uses computers or advanced communication systems.

Instructional technology (IT) - the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning (Schlosser & Simonson, 2000).

Cultural Competence - the willingness and ability of a system to value the importance of culture in the delivery of services to all segments of the population. It is the use of a systems perspective which values differences and is responsive to diversity at all levels of an organization (Consulting, Educational, & Organizational Services, 2001).

Cultural relativism - the view that all ethical truth is relative to a specific culture (Anderson, 2004).

E-readiness - considering whether the necessary infrastructure is in place, looking beyond that to whether IT is accessible to the population at large, and whether or not there is an appropriate legal and regulatory framework to support its use.

E-readiness assessment – a tool to determine a country's readiness to integrate technology and e-commerce and establish a benchmark for regional comparison and public and private sector planning (Bridges.org, 2001a).

Areas of food and agriculture - the areas related to food, food availability and security, agriculture, natural resources and its conservation, environmental sciences, life sciences and biological area.

E-commerce - financial and commercial transactions over open networks, such as the Internet (Mohammed & Goldschmidt, 2001).

Political - the selfish interests of authorities to maintain and grow power; power within the institution.

CHAPTER II

LITERATURE REVIEW

This chapter was divided in four areas: Distance Learning, Culture, Assessment and Readiness, and Animal Biotechnology Situation in Latin American Countries.

Distance Learning

Barker (1999) quoted that “Distance learning and distance education are terms that are often used synonymously, although the former focuses on the learner and the latter on the provider” (p. 36). The present research focused on both, being the learner the first step or concern and a consequence of a thorough learner analysis it was focused on the provider.

Traditional education systems are challenged world-wide by demographic explosion, expansion of knowledge and scarce resources in developing countries. Distance education opens a major perspective in the search for an international solution to this problem. Olcott (1997) stated that the rapid changes precipitated by technology and market demands on the educational enterprise will require a major shift in the ways colleges and universities do business. It is somewhat disconcerting that many institutions in the developing world believe that they could survive by avoiding these changes. Many are paralyzed by the principle of continuing to do things the same way and yet expecting different outcomes.

In his massive study, Hofstede (1980) concluded that culture was found to explain more of the nonrandom variance in attitudes and behaviors than did any of the competing variables, including the employee's profession, level within the organizational hierarchy and his or her specific job, age, and gender.

Currently, distance learning has grown into a higher education industry and has become one of the main pathways to global education (Steyn, 2001). Alexander and Blight (1996) stated that “the combination of information technologies and telecommunications has meant that world events are no longer localized, but spread around the world within a split second via technologies…For those with access to these technologies, the global village has arrived” (p. 20). Allen and Presnal (2000) asserted that technology is used in education because it could improve access to education. It reduces cost/increase efficiency, improves quality, provides “on demand” or “just in time” learning, and allows a learner centered approach. They also suggested that important factors an institution reviews when implementing an electronically mediated learning program are: (1) a need for the program, (2) institutional “buy in” and support from administration and faculty, (3) quality instructional content, (4) student support services, and (5) technology resources. Thus, it is important to measure the readiness of the institutions (researchers and administrative personnel) and to assess each institution’s infrastructure.

If information and communication technologies are used effectively, Sachs (2003) stated that they could help create a trained, educated and healthy workforce capable of building a vibrant and successful economy. The value of a network increases

as its number of users grows. By participating in the global information network, developing nations not only add value to the rest of the world, but also benefit from the ability to use the network to communicate and trade with all other users. For this reason, he proposes that it becomes ever more important for the developing world to get ready for the networked world. Their participation in the networked world could provide new ways for developing countries to improve their economic, social, and political well-being.

Chacón and González (1997) identified four primary stages of the evolution of distance education in Latin America. From 1946 to 1966 the early stage where correspondence and radio education were the basis of distance education. The stage of the tele-education era, from 1967 to 1976, where television was used as a mass education medium. From 1977 to 1989, modular distance education where open universities and open external programs lead distance education. And from 1990 until now, emerging interactive learning systems with digital information and communication technologies. They also stated that distance education has been adopted throughout Latin America, playing an important role in the distance education arena, the awareness of globalization, and the effect of the educational systems in the developed countries.

Chacón (1999) concluded that an extraordinary effort of international cooperation is required to promote the change of paradigm of distance education towards the new technology in Latin America. Carrasco, Fuentes-Berain, and Martínez (2003) found that one of the weaknesses on Latin America in the distance education area is infrastructure. Although, Chacón mentioned that the new educational paradigm

transcends the mere fact of possessing new machines, it is a change in education, meaning that "the relationships among the actors in the teaching and learning process are changed" (p. 142). There is a need to stimulate development of distance education in those countries which have not had resources to create significant programs.

Rigou, Sirmakessis, and Tsakalidis (2004) found that even though North Americans are aware that there has been a wide use of distance education in Latin America, there has been limited contact between practitioners there and their American and Canadian counterparts. The main reason the work of Latin American educators is relatively unknown is that most of their work is published only in Spanish or Portuguese. Shih, Antoni, Asirvatham, Chang, Chee, Dow, et al. (2003) mentioned that since distance education could be accessed from anywhere in the world, distance education platforms and systems should consider multilingual support for the international society.

Provenzo, Kurth-Schai, Green, and Wexler (2000) stated that "there is almost no discussion of social and cultural issues involving computing. In the rare instances when there are references to social and cultural… [studies], they certainly do not reflect the most advanced thinking in either educational studies" (p. 8). And they add that "there was a growing awareness during the 1980s that computers could be adapted to the needs of special populations, there was relatively little discussion in the educational computing community about the social and cultural significance of the use of this new technology" (p. 9).

Carrasco, Fuentes-Berain, and Martínez (2003) affirmed that a region's market environment, composed of firms and individuals that interact within a country, is

segmented into three different tiers: high-income markets, such as Brazil, Mexico, and Chile; emerging markets, such as Costa Rica, Colombia, and Uruguay; and developing, low income markets such as Bolivia, Guatemala, and Haiti. This segmentation is based not only on gross domestic product (GDP) or other economic factors, but also on the maturity of the nations' political and legal systems as well as their social and cultural structures. They quote that "most Latin American governments are notorious for sitting at the train station watching as the Internet express passes by, because politicians in the region are focusing on urgent matters and leaving out of their agenda important ones, such as networked readiness, hoping to catch the train at the next (nonexistent) station" (p. 104).

It is easy to describe factual developments in the field of distance education in different places in the world. However, it is much more difficult to produce judgments of value about their quality. Quality is a subjective rather than an absolute concept and may be examined from different analytical perspectives: consumers' satisfaction level, intrinsic value of scientific and technical content of learning materials, soundness of learning strategies, efficiency of organization and procedures, adequate use of advanced technologies, reliability of student support mechanisms, etc. These parameters should be put into the context of specific objectives, nature of target populations and availability of different kinds of resources. In a specific geographic, social, economic, and cultural situation a given set of solutions might be judged as adequate and deserving the qualification of "good practice" while in a different context it could be considered of rather poor quality (Rocha, Carmo, & Bidarra, 2000).

Culture

There are many definitions of culture. In a comprehensive study of the definitions of culture by Kroeber and Kluchohn (1952) they concluded that most of the social scientists agreed that "culture consist of patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiments in artifacts; the essential core of culture consists of traditional ideas and especially attached values" (p. 161). Hofstede (1984) quoted that "culture is to a human collectivity what personality is to an individual" (p. 21). The present study intends to point out that differences due to culture must be taken into account whenever international programs are thought, analyzed, and developed.

Blight, Davis and Olsen (1999) stated in their study that globalization of higher education ignores cultural identities, and it increases with the use of distance education. New views of education describe learning as the appropriation of cultural practices and the development of an identity within those practices (Holland, Lachicotte, Skinner, & Cain, 1998; Lave & Wenger, 1991; Wenger, 1998), not only for languages, but also for everything that involves cross or multicultural practices.

Rigou, Sirmakessis, and Tsakalidis (2004) stated that communities share common problems, and goals, and could promote solutions and progress if one gains insight into their "accumulated" knowledge. Church (1987) pointed out that often people fail to address the issue of the omission of important culture-specific constructs that are indigenous to a particular culture. Leung and Zhang (1995), after a review of various viewpoints, concluded that indigenous research and theorizing, as well as research that

integrates different cultural perspectives, are crucial to the establishment of more useful and universal psychological theories.

Child (1981) concluded that organizations in different countries around the world are becoming more and more alike, but that the behavior of people within those organizations is maintaining its cultural specificity.

Hall (1959) stated that "experience is something man projects upon the outside world as he gains it in its culturally determined form" (p. 123). Thus, experience begins with how we sort, select, and create our personal realities, which is dependent of cultural settings.

Cultural differences have such importance that it could lead to success or failure of any venture involving multi cultures; Hunt and Vitell (1986) proposed that “cultural norms affect perceived ethical situations, perceived alternatives, perceived consequences, deontological norms, probabilities of consequences, desirability of consequences and importance of stakeholders” (p. 10). Deontological norms focus on the specific actions or behaviors of an individual, and the consequences of those actions or behaviors are focused by teleological norms. In other words, as Vitell, Nwaechukwu and Barnes (1993) stated “deontological theories are concerned with the inherent righteousness of the behavior or action, whereas teleological theories are concerned with the amount of good or bad embodied in the consequences of the behavior or action” (p. 754).

For this purpose, two studies of culture will be used, to explain those differences and to set the guidelines to understand and be aware of them.

The first study is from Banks (2001) who has identified six major cultural elements in the educational arena:

1. **Values and behavior styles**. Values are one of the most important elements of culture; they are abstracts and generalized principles of behavior with high worth attached by members of a society that acquire them by socialization. Hofstede (1980) defined it as “a broad tendency to prefer certain states of affairs over others” (p. 18). Values are often viewed as central tenets of a society's culture (Kluckhohn & Strodtbeck, 1961), representing that which is explicitly or implicitly desirable to a group or an individual. They are seen as relationships among abstract categories with strong emotional components attached; they predispose individuals to a preference for a given end state or outcome. Triandis (1979) suggested that values influence behavior by providing nonspecific guidelines toward pursuing end goals. Values affect perception by increasing or decreasing the chance that a stimulus will be perceived by an individual. In addition, values are believed to influence the interpretation of response outcomes of work, causing some outcomes to be positive reinforcements and others negative. Rokeach (1973) viewed values as global beliefs that guide actions and judgment across situations; he described values as learned mental programming which results from living within a specific culture.
2. **Languages and dialects**. How people view and interpret the world is reflected in their language. A major advantage of human language being a learned symbolic communication system is that it is infinitely flexible, although it reflects values,

practices, beliefs, etc., of each culture. Languages evolve in response to changing historical and social conditions. Through the study of other languages, people gain a knowledge and understanding of the cultures that use the language. In fact, people cannot truly master the language until they have also mastered the cultural context in which the language occurs (Standards for Foreign Language Learning, 1996). There are many philosophical perspectives that maintain that language and culture are inextricably bound together (Agar, 1994; Belz, 2003; Byram & Morgan, 1994; Kramsch & Thorne, 2001). Bakhtin (1981) asserted that:

> Language is not a neutral medium that passes freely and easily into the private property of the speaker's intentions; it is populated, overpopulated—with the intentions of others. . . . Language is not an abstract system of normative forms but rather a concrete heteroglot conception of the world. All words have a "taste" of a profession, a genre, a tendency, a party, a particular work, a particular person, a generation, an age group, the day and hour. Each word tastes of the context and contexts in which it has lived its socially charged life; all words and forms are populated by intentions (pp. 273–274).

Following Halliday's (1978) conceptualization of language as social semiotic, Kramsch (1993) argued that language reflects a person's belief system, values, and comprehension of the world, and it "anchors culture in the very grammar we use, the very vocabulary we choose, the very metaphors we live by" (p. 8). Morgan and Cain (2000) claim that the link between language and culture

has to be viewed as a connection going both ways, which could be conceptualized as three possible relationships: a) language denotes culture, meaning that that using a foreign language necessitates an understanding of the values behind the language (Byram & Morgan, 1994); b) language creates cultural categories, implicating that communicating through language is necessarily dependent on the meanings attached to and created by the words used (Fantini, 1995); and c) culture shapes language. Hymes (1973) argued that while languages may be superficially equal in linguistic terms, in reality speech forms may be given differential value in terms of how well they harmonize or clash with the cultural order established by their community's values and beliefs. Bruner (1974) went a step further and described how access may be denied to those who lack the appropriate mastery of language nuances within a given culture.

3. **Nonverbal Communications**. Communication is far more than speech and writing. Most of the people are unaware that they are communicating in many different ways even when they are not speaking. This is rarely learned about non-verbal human communication in school even though it is very important for effective interaction with others (O'Neil, 2005). Growing up in a society, people learn how to use gestures, glances, slight changes in tone of voice, and other auxiliary communication devices to alter or emphasize what we say and do. People learn these highly culture bound techniques over years largely by observing others and imitating them, which is by living among people with the

same culture. O'Neil (2005) assets that linguists refer to all of these auxiliary communication devices as paralanguage. It is part of the redundancy in communication that helps prevent ineffective communication. It could prevent the wrong message from inadvertently being passed on. Paralanguage is often more important in communication than what is actually being said orally. It has been suggested that as much as 70% of what we communicate when talking directly with others is through paralanguage (Nowicki & Duke, 1994).

4. **Cultural Cognitiveness**. When individuals are aware of and think their culture is unique and distinct from others, it involves the process of knowing including judgment. Bakhtin (1986) argued that "[i]n the realm of culture, outsideness is a most powerful factor in understanding. . . . A meaning only reveals its depths once it has encountered and come into contact with another, foreign meaning" (p. 7). Such distancing from one's own perspectives through the interaction with "foreign" partners and perceptions is oftentimes the essential first step for people to begin the process of reflection on their own environment and cultural baggage (Schuetz, 2005).
5. **Perspectives, World Views and Frames of Reference.** Because of the shared sense of identity described below, people within the same ethnic group often view reality in a similar fashion. These are normative within a culture. "Cultures are epistemological communities" (Banks, 2001, p. 75). The social perspective considered culture from a social point of view.

6. **Identification**. When an individual identifies with their culture, and feels part of the group, internalizes its goals, interests, aspirations, values and standards. These could vary greatly from almost non identification to total identification. Cultural identity is defined by Sysoyev (2001) as:

> An individual's realization of his or her place in the spectrum of cultures and purposeful behavior directed on his or her enrollment and acceptance into a particular group, as well as certain characteristic features of a particular group that automatically assign an individual's group membership (p. 37).

The second study is from Hofstede (1984) who offers four dimensions of national culture, among which Banks' elements could be found:

1. **Power Distance**. The basic issue is human inequality, which could occur in areas such as social status and prestige, wealth; laws, rights and rules, and power. "…different societies put different weights on status consistency among these areas" (p. 65). He defined power distance as the extent to which the less powerful individuals in a society accept inequality in power and consider it as normal. Even though inequality exists in every culture, the degree to which it is accepted varies from culture to culture. He considered inequality multidimensional. In organizations, inequality is inevitable and functional, and usually formalized in hierarchical boss-subordinate relationships. In small power distance countries, there is only limited dependence of subordinates on bosses; in large power distance countries, this dependence is higher.

2. **Uncertainty Avoidance**. Uncertainty about the future is a fact in which people try to cope through the domains of technology, law, and religion. In organizations the domains are technology, rules and rituals and the indicators of these domains is orientation, employment stability and stress. Vitell, Nwaechukwu and Barnes (1993) defined it "as the extent to which individuals within a culture are made nervous by situations that are unstructured, unclear, or unpredictable, and the extent these individuals attempt to avoid these situations by adopting strict codes of behavior and a belief of absolute truth" (p. 754). Cultures with weak uncertainty avoidance are thoughtful, reflective, meditative, less aggressive, tolerant, unemotional, and accept personal risk, on the other hand, cultures with strong uncertainty avoidance are aggressive, emotional, intolerant and active, and seek for security.
3. **Individualism/Collectivism**. This dimension "describes the relationship between the individual and the collectivity which prevails in a given society. It is reflected in the way people live together" (Hofstede, 1984, p. 148). A number of scientists have written about individualism and related values (Zavalloni, 1980). Parson (1951) considered many pairs of value orientations, although he saw as central to many social behaviors and many institutional systems the difference between self-orientation and collectivity-orientation; the first is the "permissibility of an actor pursuing any interest 'private' to himself or to a small in-group" (p. 60), whereas the later refers to the actor's obligation to pursue "the common interest of the collectivity" (p .60). According to Sampson (1977), this may mean social

synergy where the “individual by the same act and at the same time serves his own advantage and that of a group… and it occurs not because people are unselfish and put social obligation above personal desires, but because social arrangements make these two identical” (Maslow, 1968, p.38). According to Hui and Triandis (1986) a concept that may be related to the extreme end of individualism is narcissism. Studies have found that narcissism is positively correlated with dominance, social boldness, tough poise, independence and extraversion, and negatively with abasement (Emmons, 1983). Hui and Triandis (1986) asserted that collectivism should be viewed as a cluster of a wide variety of beliefs and behaviors, which come under one of the following seven categories:

- Consideration of implication-costs/benefits- of one’s own decision and/or action for other people.
- Sharing of material resources, which mean a network of relationships. “Loaning, borrowing, and giving are all ways of building or maintaining a social network of reciprocation; collectivists would go to great lengths to maintain social relationships by these means.” (p. 229).
- Sharing of nonmaterial resources, which are less tangible and usually not returnable, for example time, affection and fun. Collectivists expect these to happen, building up or strengthening the social network; while individualists belief that people should take care of themselves.

- Susceptibility to social influence. Collectivists are more susceptible to pay more attention to the influencing agent than are individualists; Collectivists are more willing to go along with the group, to avoid being rejected. As harmony is highly valued, conforming as to preserve interpersonal relationships occur even if it is very costly.
- Self-presentation and face work- collectivists are very concern with gaining the approval of the collective and feel shame if they fail to get it. Individualists do not care much about loss of face.
- Sharing of outcomes, meaning that collectivists value interdependence, a person's misbehavior or failure is a disgrace for the family, while in an individualistic culture it does not seem to affect other people, they feel they are insulated from others.
- Feeling of involvement in other's lives-Collectivists are so involved in others lives that the others experiences could have direct or indirect consequences for them; while for individualists social world is segmented.

These seven aspects of collectivism are summarized by the authors as "concern" as a sense of oneness with other people, "a perception of complex ties and relationships, and a tendency to keep other people in mind" (p. 231). They claim that collectivism is the recognition that the basic unit of survival is a group and not the individual.

4. **Masculinity/ Femininity**. The duality of the sexes is managed by different societies in different ways "the issue is whether the biological differences

between the sexes should or should not have implications for their roles in social activities" (p. 176). This dimension is transferred by socialization in families, schools, peer groups and through the media. Hofstede (1984) stated that the most predominant socialization pattern is for women to be more nurturing and men more assertive. For organizations this dimension is viewed through the relation of organizational goals and career possibilities; certain types of organizations have more masculine goals, and less have more feminine goals.

Hofstede (1984) concluded that cultures are changing, and a reason for this is the proliferation of the results of scientific discoveries, although this does not mean cultures will become more similar, it means some countries may follow different dimensional trends and some trends will be felt worldwide.

Fernandez, Carlson, Stepina and Nicholson study (1997) coincided with Hofstede's study (1984), where they concluded that Mexico and some Latin American countries fell above the mean on power distance. This finding suggested that these countries have large power distances or believe that power is distributed unevenly in organizations and society. Conversely, the United States scored below the mean, indicating that these countries have small power distances. In the same studies, but in the masculinity/femininity dimension, Mexico and Chile scored above the mean on this dimension, and thus were classified as masculine countries. Masculine countries favor men for positions of power in organizations and prefer a more singular rather than dualistic role for both men and women in society. The United States scored below the mean, making this country more feminine in nature.

The two studies were interrelated, and could be found within each other in some aspects, but both expose aspects very distinctively for cultural differences, which will help to develop an understanding of the guidelines resulting in the present research.

Assessment and Readiness

The bridges.org (2001a) document stated that “E-readiness assessments are a valuable tool with which to gain more informed, region-specific understanding and to develop an action plan” (p. 4). A challenge for cross-cultural assessment is to construct an inventory suited to the local needs while retaining the standards of validity and reliability expected of established assessment instruments (Cheung, 1996).

Readiness is not merely to be ready to get involved in a distance learning venture, but also about the expectations of the institutions for the distance learning projects. Readiness assessment could give information about skills, strengths, weaknesses, opportunities, and threats (SWOT analysis), and special needs (Carrasco, Fuentes-Berain, & Martínez, 2003).

Assessment techniques are usually either norm referenced or criterion referenced. Norm referenced assesses an individual's performance in relation to the norms established by a peer group. Criterion referenced occurs when for example, a student is assessed on his or her ability to meet a required level of skill or competence (O'Keefe, 1999). For the purpose of the present research, criterion referenced will be used, being the measurement of the ability of the participants that is required. To obtain data about

Latin American researchers and institutions readiness, and to set programs within the intended project, according to the assessment results.

Bond (2000) cited three reasons that the importation of assessment theories from the U.S. to other countries should be rejected. First, the measure and the relevant theory will affect the development of a local theory. Second, the receiving culture may not have the necessary support for translating and interpreting such a test and extending its theories into their new cultural territory. Consequently, the imported constructs and measures may not be as appropriate as indigenous instruments or theory in predicting key outcomes. Third, the imported instrument and its theory may not fully encompass the local reality associated with a concept.

Based on these assumptions, this research aimed to create an assessment instrument where cultural differences are embedded, but through the users' cultural mental processes, founding it in culture theories developed by U.S. researchers, who explain these cultural differences through the same eyes.

One of the basic features to measure distance education readiness is the use and availability of technology. The Bridges.org (2001b) claimed that each country and group has a unique profile for how technology is used, or not. While a few countries rate low on many of the metrics for information and communications technology (ICT) use and readiness, most have a mixture of positive and negative ratings. They also mentioned that having access to technology is critical, but it must be about more than just physical access. Computers and connections are insufficient if the technology is not used effectively because it is not affordable; people do not understand how to put it to use, or

they are discouraged from using it; or the local economy cannot sustain its use. This document also analyzes the digital divide as a complex problem that manifests itself in different ways in different countries. It also mentioned that it is apparent that solutions which work in developed countries cannot simply be transplanted to developing country environments or the other way around. They propose that solutions must be based on an understanding of local needs and conditions. The report states that “real disparities exist in access to and use of ICT between countries (the ‘international digital divide’) and between groups within countries (the ‘domestic digital divide’)” (p. 3).

There are many factors to consider when assessing the use of technology; Bridges.org (2001b) shared the factors for effective and sustainable ways of technology usage in their study, among which they mentioned:

1. Physical access. Is technology available and physically accessible?
2. Appropriate technology. What is the appropriate technology according to local conditions, and how people need and want to put technology to use?
3. Affordability. Is technology access affordable for people to use?
4. Capacity. Do people understand how to use technology and its potential uses?
5. Relevant content. Is there locally relevant content, especially in terms of language?
6. Integration. Does the technology further burden people's lives or does it integrate into daily routines?

7. Socio-cultural factors. Are people limited in their use of technology based on gender, race, or other socio-cultural factors?
8. Trust. Do people have confidence in and understand the implications of the technology they use?
9. Legal and regulatory framework. How do laws and regulations affect technology use and what changes are needed to create an environment that fosters its use?
10. Local economic environment. Is there a local economy that could and will sustain technology use?
11. Macro-economic environment. Is national economic policy conducive to widespread technology use, for example, in terms of transparency, deregulation, investment, and labor issues?
12. Political will. Is there political will in government to do what is needed to enable the integration of technology throughout society? (p. 5).

On the other hand, Carrasco, Fuentes-Berain and Martínez (2003) declared that information technology (IT) is a very important element of networked readiness, but it is just that, one element. Other factors need to be assessed under a regional environment, which is primarily defined by four major forces: market, public policies, regulatory rules, and infrastructure.

Sachs (2003) argued that the minimum necessary condition for readiness is access to adequate network infrastructure. Access is determined by a combination of the availability and affordability of use of the network itself, as well as of the hardware and

software needed for network interface. The quality and speed of the network are also important in determining how the network is used. Considering these, the instrument on this research included the measurement of availability and affordability, as well as the quality and speed, not only in infrastructure characteristics, but through participants' perception.

In a study conducted by the Masie Center (2001) with U.S. participants, it was found that the amount of support project participants received actually increased their willingness to begin the technology-delivered portions. The level to which participants felt they were supported was one of the primary indicators regarding their participation in e-learning. Also research indicates that an instructor's motivating style is an important educational construct (Deci, Nezlek, & Sheinman, 1981; Ryan & Grolnick, 1986) because it affects students' developmental and academic outcomes (Ryan & Deci, 1987; Deci, Vallerand, Pelletier & Ryan, 1991; Reeve, 1996).

Carrasco, Fuentes-Berain, and Martínez (2003) stated:

> Society in Latin America is an allegory of duality. Although high-end consumers are in the minority, their demographics are more encouraging (they are younger and have larger families) than their peers in developed countries. Whereas moderately low-income and very low-income urban citizens, 88 percent of whom are literate, are poor by international standards, but they are also hungry for unconventional ways of becoming networked ready (p. 2).

Assessment has become a suitable way to incorporate possible participants to projects, assuring all stakeholders are aware of each other's characteristics. It also

prepares the programs to suit the needs and realities of participants, which include the institutions that initiated the projects. Assessment needs to consider cultural issues; the way to ask, or what to ask may be the key to understandable and honest answers, which will lead to precise assessment results.

Animal Biotechnology Situation in Latin American Countries

Infrastructure for biotechnology research and development in Latin America was mainly governmental, and varied greatly from country to country, as a result of the diverse political promotion and state investment provided to science and technology in general. Also, these differences were based on the country sizes and economic capabilities (Verástegui, 2003). All the sixteen countries in this study had at least one research animal biotechnology center. Verástegui, Cohen and Komen (2001) declared that in a study in 2000 over 40% of the researchers had graduate studies. Argentina and Colombia had over 18 research centers and more than 250 biotechnology researchers. Chile and Venezuela had the highest rate of researchers with a Ph.D degree.

In general, Solleiro and Castañón (1999) claimed that the primary causes of the slow development and the incipient state of biotechnology in Latin America were the resistance of traditional companies to technological change and the lack of capacity for research and development in the enterprises.

Argentina, Mexico, Chile, Colombia and Venezuela were the most advanced countries in Latin America, although the last four, have to overcome some marketing

barriers, regulations, and technological innovation financing mechanisms (Verástegui, 2003).

The Inter-American Institute for Cooperation on Agriculture (2003) reported 526 animal biotechnology institutions in Latin America and the Caribbean, including universities. A large number of animal biotechnology institutions throughout Latin America had projects and programs, national and international, which aimed not only to promote and develop animal biotechnology, but also to follow a" train the trainer" approach. A few examples are included in the next paragraph:

United Nations University Program for Biotechnology in Latin America and the Caribbean (UNU/BIOLAC) was established in January 1988 in Caracas, Venezuela. The Program promoted the development of biotechnology in the Latin American and Caribbean region. The Program supported networks on bio-ethics, bio-safety and bioinformatics according to the new reorientation. Well defined aims guided the planning of fellowships, training courses, and workshops addressed to young scientists and professionals identified by the networked coordinators and collaborators. The main purpose was to develop a career for these selected participants who will have the responsibility to teach others. This capacity development had a "train the trainer" approach (Ramirez, 1999).

CamBioTec (the Canada–Latin America Initiative on Biotechnology, Environment and Sustainable Development) was launched in January 1995 by the International Development Research Centre (IDRC) of Canada. The objective of the initiative was to promote the introduction of biotechnology-based products and

applications to respond to critical needs in the agro-food and environmental management sectors of selected Latin American countries. The initiative had targeted four Latin American countries for the initial phase of its work: Argentina, Colombia, Cuba, and Mexico. Together, these countries possessed a vibrant biotechnology sector and offered a range of opportunities for the application of biotechnology and for the development of partnerships with Canadian firms and institutions. Contacts had also been established with counterpart institutions in Brazil, Chile, Costa Rica, and Venezuela and, as funds permit, the initiative will be expanded to encompass some or all of these countries (International Development Research Center, 2003).

The International Centre for Genetic Engineering and Biotechnology (n.d.) conducted innovative research in life sciences for the benefit of developing countries. It strengthened the research capability of its members (twelve Spanish-speaking Latin American countries) through training and funding programs and advisory services and represents a comprehensive approach to promoting biotechnology internationally. The Centre was dedicated to advanced research and training in molecular biology and biotechnology and held out the prospect of advancing knowledge and applying the latest techniques in the fields of public health, energy production, and industrial production of high added-value commodities, nutrition and environmental protection/remediation.

RedBio (2005) (Network of Technique Cooperation in Biotechnology) supported by the Food and Drug Organization (FAO), was one of the most important organizations in biotechnology; it gathered 32 countries of Latin America and the Caribbean, with more than 4300 researchers registered. Through their Web page they published

researchers' information and promoted knowledge, technologies and biological material exchange, endorsing learning, training, and biotechnological innovations to solve production and research problems of the biotechnology area in Latin America and the Caribbean.

The Cartagena Protocol on Biosafety was the main international instrument for addressing biodiversity issues. "It provides a comprehensive and holistic approach to the conservation of biological diversity, the sustainable use of natural resources and the fair and equitable sharing of benefits deriving from the use of genetic resources" (Secretariat of the Convention on Biological Diversity, 2000, p.1). It provided access to and transfer of technologies which were relevant to the conservation and sustainable use of biological diversity, ensuring the development of appropriate procedures to enhance the safety of biotechnology. Basically, "it provides an international regulatory framework to reconcile the respective needs of trade and environmental protection with respect to a rapidly growing global industry, the biotechnology industry" (p. 1).

Animal biotechnology circumstances in Latin America vary among countries, although they could be set in a segment with general characteristics. For example in Chile, there were some universities and institutions dedicated to animal biotechnology. An outstanding organization was the National Institution of Agricultural and Animal Research (INIA for its abbreviation in Spanish) that had specialized research and researchers in animal biotechnology, dedicating substantial budget to its development through equipment, facilities, personnel development and international projects, and giving support to the country needs. Researchers in this institution were encouraged and

demanded to continue their specialized studies, through graduate studies nationally and internationally (Gobierno de Chile, 2005). Chile considered biotechnology as a means to solve their limited natural resources, allowing them to find competitive niches in the world market to give them a competitive advantage (Verástegui, 2003). According to the National Commission for the Development of Biotechnology of Chile (Comisión Nacional para el Desarrollo de la Biotecnología, 2003) there were as many as 48 majors related to biotechnology and 41 graduate programs, which were up to its maximum capacity; and 31 companies and 42 labs dedicated to biotechnology. This national commission proposed the increment of research training in biotechnology as a national policy, especially international training, focusing on developed countries specifically the U.S., through international projects.

Argentina was one of the countries in Latin America with the most researchers and institutions in animal biotechnology. The Secretariat of Science and Technology (Secretaría de Ciencia y Tecnología, 1997) from Argentina stated that although generic technologies in biotechnology were available to everyone, specialized technologies were copyrighted, and that industrialized countries strongly tended to privatize scientific knowledge and to delay the publication of results that could have had commercial application. They asserted that even though infrastructure was not everything to develop research, it was of great importance and more, if the desire was to be at the same level of global research in animal biotechnology and be competitive. This document also stated that development of this area in the industrial arena was very restrictive due to the lack of private investment that could be caused by the deficiency of knowledge about this

area, creating a vicious circle, because in order for it to be known, research advances must be publicized and practical results in the market must be seen. In 1982, the National Biotechnology Program was launched in Argentina, and important international biotechnology projects were developed. According to Verástegui (2003) by 2002, there were more than 115 biotechnology research centers, with 68 (41 companies and 27 research groups) dedicated to animals and agriculture.

Biotechnology security was a topic commonly heard though out the world, especially now in the Latin American countries, because they were promoting seriously that biotechnology be an active part of the world globalization. Bolivia had invested in projects, mainly with the U.S., to enhance biotechnology security. One of the most important ones was the project entitled "Institutional strengthening for the management of biotechnology security" where they looked to embrace the Cartagena Treaty. At the same time the cover national needs, expectations, strengths and weaknesses, and promote the biotechnology network that works through Redbio (Saravia, 2000). By 2002 Bolivia had 46 laboratories dedicated to research, production, and marketing. However, only 9% develop animal biotechnology research. And only two universities had research and academic programs in biotechnology (Verástegui, 2003).

In Colombia, according to Schuler and Orozco (2006), the notion of biotechnology existed since the 1970s. By the 1980s they had gathered researchers of this area in several organizations, from federal and from private and public universities. By the 1990s, with the opening of the markets, the government embraced biotechnology strongly and created mechanisms to link research with the regions' needs, markets,

universities, productive sectors, and the community. By 2005, Colombia had 85 biotechnology research groups engaged in 819 national and international projects. All biotechnology research had been institutionalized around the National Biotechnology Program that had as its main function the support of the biotechnology network. Verástegui (2003) affirmed that by 1999, there were 74 research groups, 35% from universities, 33% from the manufacturing sector, and the rest from research centers and public organizations. From all these, only seven percent was dedicated to animal biotechnology. He also stated that by that time there were 537 registered biotechnology researchers, 43% with graduate studies, but only seven percent specialized in animal biotechnology. Colombia was one of the Latin American countries more advanced in biosecurity regulations.

According to León (2005) Costa Rica had a low rate of international projects through their education organizations. Valdez, López and Jiménez (2004) validated this in a study where they found that 95% of the biotechnology researchers were nationals with no international experience. They also became aware that a high percentage of the researchers were women, above the international average, and 88% are less than 50 years old. León asserted that Costa Rica was constantly selected by international investors to develop biotechnology laboratories, because they found economic and political stability and a trained and bilingual work force. A company in Costa Rica created a Web page that established the basis for a virtual scientific community that encouraged the development of biotechnology research. León mentioned that the Web page was the link between researchers, the solution of biotechnology problems in

research, and markets and production. Costa Rica had a network of researchers and biotechnology private and public organizations that linked researchers with the national and regional need, as well as with universities and production and manufacturing companies (Comunidad Biotecnológica Costarricence S.A., 2005).

Ecuador had a state organization for biotechnology research, the Autonomous National Institute of Agricultural Research (INDIA for its abbreviation in Spanish), and they coordinated the National Commission of Biosecurity, which followed the Cartagena Protocol. The biotechnology research developed was mainly in the agricultural area, very little in the animal area (Verástegui, 2003). Ecuador had important international projects to enhance biotechnology research. One of them was with the United Nations whose main objective was the development of biotechnology research based on regional needs under a biosecurity framework. There was also an important program with USAID, whose main objective was the training, creation, validation and transfer of technology, specifically biotechnology (Bravo, 2003). According to Verástegui, in 2001 the university biotechnology network was created, gathering biotechnology researchers from all over the country. Currently, it organized national and international conferences as well as research and technology exchanges. He also stated that the National Foundation for Science and Technology (FUNDACYT for its abbreviation in Spanish), was the federal organization that managed national and international financing budget.

In El Salvador, biotechnology was regulated and impelled by law (Vega, 2003). Recently it had gained more attention because of its relation to biosecurity, which has

been a topic of most importance all around the world. This situation opened wide possibilities for international exchange.

Orozco (2004) reported that Guatemala had 45% of the institutions dedicated to biotechnology were private, 30 percent were academic and 25 percent were governmental. From this, a very small percentage was dedicated to animal biotechnology (14%). Research was developing in this area because only recently the different organizations began to pay attention to this section of biotechnology with globalization affecting their meat production and regional problems. He also reported that half of the laboratories belonged to different national or international biotechnology networks. Seventy percent of the population in Guatemala was indigenous, and only seven labs had projects with native groups. International projects were mainly with other Latin American countries, although he mentioned several with the U.S. Verástegui (2003) stated that Guatemala was considered very advanced in biotechnology. In 1988 the Inter-American Institute for Cooperation on Agriculture (IICA) recognized 40 research centers for its excellence and 24% were located in Guatemala.

As most countries, Honduras subscribed to the Cartagena Protocol for their legal framework in the biotechnology arena. The United Nations Environment Programme and Global Environment Facility (2003) mentioned that the National Commission of Biodiversity of Honduras was the organization in charge of promoting biotechnology. One of their main objectives was the engagement of international projects with this country. Biotechnology research was developing slowly, especially in the animal area, and infrastructure and trained specialists were required.

In Mexico, biotechnology was somewhat new. In the past three decades this area had gown and important federal budget had been dedicated to it. As with the rest of Latin America, the growth and development of all the areas of biotechnology had been unequal, some with research that could measure up to international standards, and others with incipient development and research (Consejo Nacional de Ciencia y Tecnología, 2006). By 2000, there were approximately 90 companies dedicated to biotechnology research and development. Specifically 30 companies were committed to animal biotechnology, with most located in the states that border the U.S. (Díaz, Castañón, Solleiro, & Ortega, 2003). In the academic arena, according to Arias, et al. (2003), Mexico counted 83 masters and 61 doctoral programs related to biotechnology and ANUIES (National Association of Universities and Higher Education Institutions) (2003), stated that there were more than 400 bachelor degree programs related to biotechnology. Since the 1980s, Mexico has developed an increasing capacity for biotechnology research, which has been noticed for the rising number of researchers and institutions dedicated to this area (Bolívar, 2002). The National Board for Science and Technology is the primary institution that provides financing for biotechnology research in this country, as well as support for international exchange (Consejo Nacional de Ciencia y Tecnología, 2006). This institution had an important number of agreements and projects with U.S. federal organizations such as the National Science Foundation (NSF) and many higher education institutions (IPICYT, 2004). A problem many authors had found is that Mexico (and most Latin American countries) did not have a specific policy regarding biotechnology, either for research or industrial application. They all had

concluded this was the main reason there was not the necessary governmental support. Díaz, Castañón, Solleiro and Ortega (2003) stated that there was little relationship between academics and the needs of the biotechnology industry in Mexico, with the lack of policies the fundamental reason for this breach. Copyright legislation in Mexico was consistent with developed countries. This had opened the possibilities of academic, research and industrial exchange in this country. Every day international projects in Mexico increased and the majority of those projects were with the U.S. (Arias, et al., 2003). Mexico had several biotechnology networks with one of the most important being the National Polytechnic Institute Biotechnology Network (Instituto Politécnico Nacional, 2005; Secretaría de Investigación y Posgrado, 2006). Verástegui (2003) pointed out that Mexico had the Mexican Society of Biotechnology and Bioengineering (SMBB for its abbreviation in Spanish) where biotechnologists from different countries are organized. They had a Web page (http://www.smbb.com.mx/menu2/delegaciones.htm), several journals, magazines and books, organize national and international conferences, and promoted research through scholarship awards. It was the only association of this kind in Latin America.

Biotechnology was developing in Nicaragua, although in the last few years and thanks to the world's tendency, research has been strengthened. The National Strategic Office for Biodiversity (Coordinación de Estrategia Nacional de Biodiversidad, 2005) stated that Nicaragua had five institutions dedicated to biotechnology. These institutions claimed that there was little done in this arena, not only in infrastructure and legal frames, but also in research expertise. It was asserted that the only way to achieve

advances is through governmental support and specialized training through national and international projects.

Panama presented the same challenges and problems most of the Latin American countries had. Pacheco and Vaprio (n.d.) claimed that one of the main problems was the lack of federal regulations, although this was changing with the raising importance of biosecurity in the world and with the attention many countries had given to rules and regulations to ensure not only commercial markets, but to give security to their populations. Panama had a number of agreements and projects with other countries, among which the U.S. could be found.

The National Strategy and Action Plan for Biodiversity Conservation (Estrategia Nacional y Plan de Acción para la Conservación de la Biodiversidad , 2003) documented that Paraguay had few international projects in the biological area, most of them with countries in South America. The ones with the U.S. were coordinated through the FAO (Food and Agriculture Organization). There were international scholarship programs to train researchers in this area, and government institutions promoted this exchange, especially in the biotechnology arena, which was starting to develop in this country. According to Verástegui (2003) Paraguay did not have a national program that coordinated or promoted biotechnology. He also asserted that most of the research done here was for agricultures. Animal research was small and only in vaccine production. Whereas the reduced private investment for biotechnology research and production made the government invest in research centers primarily for animal vaccine production.

The National Council for Science and Technology of Peru (Consejo Nacional de Ciencia y Tecnología, n.d.) declared that infrastructure for research in Peru was insufficient and rather old. The majority of the research centers were from the state and federal universities. The Minister of Exterior Relations and the President's Office were the channels through which international projects could be achieved and they left the legal framework to the National Council for Science and Technology. According to Fernández-Northcote (2003) Peru had 19 graduate academic programs in biotechnology. He also pointed out that there was no legal framework for biotechnology or biosecurity. Verástegui (2003) stressed that almost 50 % of the companies dedicated to biotechnology were small with less that 10 researchers and technicians and, although they had limited budgets, their investment in research was from five to ten percent of their capital.

Uruguay had the National Institute for Agricultural Research (INIA for its abbreviation in Spanish) in the biotechnology area. They had established strategic alliances, agreements, joint ventures, and cooperative networks through a large number of international and national projects (Instituto Nacional de Investigaciones Agropecuarias, 2005). Aldabalde (1998) affirmed that biotechnology research in Uruguay had great potential, but it was necessary to have governmental and private support. She mentioned that federal regulations were the spindle to achieve development in this area and they were almost non existent. The University of the Republic and the Institute of Biological Research "Clemente Estable" were the main centers of

biotechnology research in Uruguay. For animal biotechnology the government only had one laboratory and it had limited personnel and resources (Verástegui, 2003).

Salazar (n.d.) claimed that biotechnology had grown the past 10 years in Venezuela, and it was divided into four main groups: public health, microorganisms, animals and agriculture. From these, the most deficient one was the one dedicated to animal biotechnology, with disease diagnostic their prime activity. Verástegui (2003) avowed that 54 % of biotechnology activity was from universities, 25% from the government and 21 % from private organizations. He also pointed that Venezuela had the Multinational System of Specialized Information in Biotechnology and Food Technology for Latin America and the Caribbean (SIMBIOSIS for its abbreviation in Spanish), whose main objective was to provide research tracking, analysis and exchange of information, and technology and knowledge transfer, primarily through their Web page (http://www.science.oas.org/SIMBIOSIS/). Versástegui also stated that it was estimated that by the year 2000 there were 4,500 biotechnology researchers (1.9 researchers for every 10,000 people) and that 54% of the biotechnology activity was developed in three universities (Central University of Venezuela, University of Zulia, and University of Los Andes).

In summary, traditional education systems (face to face) were challenged world-wide by demographic explosion, expansion of knowledge, and scarce resources in developing countries and distance education has opened a major perspective in the search for an international solution to this problem. International solutions bring different cultures together, which have specific elements (Banks, 2001) and/or

dimensions (Hofstede, 1984). These have to be considered when developing distance learning programs.

Animal biotechnology in Latin America was in a developing stage, although recently, it has been promoted by biosecurity, which has been a main concern in the U.S. All Latin American countries lacked of federal regulations in this area but had specific federal organizations that were in charge of biotechnology. Biotechnology networks played an important role in information exchange through out Latin America.

CHAPTER III

METHODOLOGY

This chapter is divided into six sections: research design, population and sample, instrumentation, pilot test, data collection, and data analysis.

Research Design

The research design used in this study combined two methods that complement and support each other: the Tailored Design Method (Dillman, 2000), and a needs assessment analysis (Rosset, 1995) through a strategic plan.

The Tailored Design Method (Dillman, 2000) was chosen because in survey research response rates are an important factor that influences the generalizability and the overall validity of study findings. With this method achievement of high response rate is increased and the study achieves the characteristics of generalizability and validity.

Needs assessment is a process that diagnoses the source of a problem. It is a powerful and systematic examination of what is in place and where the "gaps" are. Furthermore, needs analysis could be used to provide better focus to existing activities and it could be used in assisting in the implementation of change and identifying areas for improvement of existing practices.

The Tailored Design Method (Dillman, 2000) considered a number of contacts, content of cover letters, incentives, personalization, and sponsorship. Its primary elements are:

1. Respondent-friendly questionnaire
2. Up to five contacts per participant
3. Personalized correspondence
4. Token incentives

A strategic planning was developed for the needs assessment analysis (Rosset, 1995):

1. Determine purpose
2. Identify sources
3. Select tools
4. Conduct it in stages
5. Use findings for decision making

Population and Sample

Population

The population for this research was the group of animal biotechnology institutions in Latin American countries that are Spanish speaking, partners with major funding organizations in the U.S., and that have Web pages on the Internet. A total of sixteen countries with animal biotechnology institutions comprised the population (Argentina, Bolivia, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala,

Honduras, Mexico, Nicaragua, Paraguay, Panama, Peru, Uruguay, and Venezuela (Food and Agriculture Organization of the United Nations, 2004; National Science Foundation, n.d; The Association Liaison Office for University Cooperation in Development, 2004; United Nations, Educational, Scientific and Cultural Organization, n.d.; United States Agency for International Development 2004; United States Department of Agriculture, n.d.)).

For the population, a directory of animal biotechnology institutions in Latin America was created, following a strategic planning:

Animal Biotechnology Directory

Purpose

The purpose of this phase was to create a Latin American animal biotechnology institution and researchers directory with information from the Web.

Operation Planning

1. Identify the characteristics of the information for the directory
2. Identify institutions on the Web dedicated to animal biotechnology in the sixteen Latin American countries established in this study
3. Identify researchers through the Internet dedicated to animal biotechnology in the sixteen Latin American countries established in this study

4. Identify animal biotechnology networks published on the Web from the sixteen Latin American countries established in this study
5. Contact the institutions dedicated to animal biotechnology via e-mail to:
    - Explain the purpose of the study through the instrument's information sheet
    - Request information about their animal biotechnology researchers
    - Request their inclusion in the directory and confirm their contact information
6. Contact the Latin American animal biotechnology researchers to:
    - Explain the purpose of the study through the instrument's information sheet
    - Request and confirm their contact information
    - Request their participation in the study and their inclusion in the directory
    - Request information of other researchers in the area
7. Determine the participants in the study and their inclusion in the directory
8. Create the Latin America Animal Biotechnology Directory

Project Planning

1. Establishment of the directory characteristics
2. Through the information in the literature review institutions, researchers and networks dedicated to animal biotechnology were identified and selected

3. An advanced search was developed to find more animal biotechnology institutions, networks, and researchers for each Latin American country in this study, and placed in alphabetical order
4. Each institution and researcher was contacted via e-mail Using the Tailored Design Method
5. Responses were replied within a 24 hrs period
6. Participants and contact information were registered
7. There are many constraints to consider when venturing in an International project, among which are communications, time and political issues, Web pages, prior studies and terminology
8. Rewards- academic incentives

Planning Process

1. Features- The elements of the directory were determined as follows:
    - The institution's name
    - Web address (Homepage address)
    - Researcher's name
    - E-mail
    - Address
    - Telephone (including country code)
    - Fax (including country code)

The research area or specialization area was intended to be included, but most participants were not willing to share this information, or in other cases the information provided was too extensive. The directory was developed in a Microsoft Excel document. Each country was set in separate sheets, in alphabetical order, with the items or characteristics horizontally, and the participants vertically (See APPENDIX A for the directory).

2. Identification and Selection -Through the literature review several institutions researchers and research networks dedicated to animal biotechnology were detected and selected. Each country had at least one institute recognized as the leading organization for their prestige or designated by the government or by law. Most of these institutions had Web pages, although some did not have any kind of contact information. Many articles and diverse documents mentioned biotechnology researchers. The first step for selection was the area of research in animal biotechnology.

   A series of biotechnology networks were identified, most with Web pages and published record books of the members. Among the most important networks Redbio provided over 4,300 researchers information through their interactive record book published on the Web. The first step for selection in biotechnology networks was to exclude the researchers from countries outside the scope of this study. The researchers dedicated to animal biotechnology were identified.

3. Search-The next phase was to search on the Web for the Latin American Institutions, researchers and networks already identified. Björneborn and

Ingwersen (2001) described some of the difficulties with data collection on the Web. They stated that “The engines do not index the entire Web, their overlaps are not substantial… and their retrieval features too simplistic for extensive… analyses online” (p. 66). To avoid limited information retrieval several Internet browsers were used. The rationale was to search (in alphabetical order) in each country’s specific browser as a first step. Google.com has specific country browsers, adding at the end of the Internet address the country’s code (For example google.com.ar for Argentina, google.com.mx for Mexico, google.com.ve for Venezuela). Advanced search was used for more specific results. Other browsers commonly used in Latin America where used: Yahoo, MSN and Mozilla.

In the literature review it was seen that all the documents mentioned the different universities that had animal biotechnology research and coordinated biotechnology networks. Thus, a search for all the universities in each country was developed. Once the Web sites were found they were browsed to acknowledge if biotechnology research was developed.

Many organizations did not have information about animal biotechnology research but their names were mentioned in other articles as having this type of research. Contact information of those responsible for biological, technological, life science, or veterinary areas was retrieved. In some cases the organization or university president or the Web master were the only contacts available, so this information was taken.

4. E-mail Interview - Following the Tailored Design Method un-structured e-mail interviews were developed and every potential participant retrieved was contacted. The letters for first contact were developed. Before each name, the adjective “Dear” was used, because in Spanish it is a courtesy that people accept professionally and positively. Also, before the name, the professional degree abbreviations (professional titles) were used (Dr., Bs, MS, Ing, etc.), because it is a common use in Latin America and a way to show courtesy and respect to the people that are contacted (See APPENDIX B).

   The content of the letter included the explanation of the study (from the instrument’s information sheet- see APPENDIX C).

   Every potential participant and organization representative was sent an individual e-mail with the subject: Animal biotechnology research study-Texas A&M University (See APPENDIX D).

   More than 3,000 e-mails were sent, approximately 150 per day. An estimate of ten percent had inactive e-mails, these were deleted.

5. Responses - All responses were individually replied within 24 hours of receiving them. Following the same format as in the first contact e-mail the respondents were thanked for their response and, depending on the type of response it was included:

   - Accepted participants- were informed they were part of the directory and they would receive an instrument to be answered as part of the research study (See APPENDIX E).

- Information senders- were again thanked for providing information about animal biotechnology in their country or about animal biotechnology organizations or researchers.
- Not from the animal biotechnology area- were informed that they would not be included in the study. (See APPENDIX F)

Depending on their responses follow-up e-mails were developed.

Forty percent of the e-mails sent did not have responses. No non-response treatment was applied for this phase.

6. Directory- All the people that accepted to be part of the study were included in the directory. The directory was created in Microsoft Excel spreadsheets; each spreadsheet contained the information of each country (See APPENDIX A for the directory). A total of 150 researchers were included in the directory.
7. Constraints:
    - Communication issues- Although Latin America is well embedded into the Internet, e-mails are not a usual form of communication. People do not check their e-mail as much as needed and e-mail address changes are high, so it is common to have non functional e-mails addresses.
    - Schedule issues- Countries in Latin America have different agendas for holidays and vacation periods, time zones are different, and thus, communication was delayed in some cases because of scheduling issues.

- Political issues- Due to the political structures in Latin American organization responses had to go through certain channels for approval, taking more time, and in some cases never contacting the intended party.
- Web pages- This was a very complicated venture because the designs of Web pages vary. Björneborn and Ingwersen (2001) affirmed that the WWW, is the world's richest source of information, but, at the same time, it was increasingly difficult to retrieve the right information from this source. Moreover, Egghe (2000) and Bar-Ilan (1999) concluded that the use of the Web as an information source is not without problems. Egghe emphasized:

> In recent years, however, the number of 'electronic' activities has increased dramatically. In most cases, this also means that data are gathered in an automatic way and hence one is inclined to think that it has become easier to collect data. This is not true. It is true that data are gathered in a much faster way, but, at the same time, their level of accuracy has fallen (p. 329).

In the design, many features were to be considered, the main one was the information offered in the content, and content according to Huizingh (2000) refers to information, features and services offered in a Web site and represent another form of communication between the user and the site. As mentioned before, Web page design and content vary greatly. It is not only a matter of

cultures, but of individuals who build the pages, with different ways of expressions.

Also, updates to Web pages are not very frequent, so the contact information of the animal biotechnology institutions was not current in some cases. Participants were asked for updated information.

- Terminology - Language is a very important and intrinsic part of culture (Banks, 2001; Agar, 1994; Belz, 2003; Byram & Morgan, 1994; Kramsch & Thorne, 2001) and although Spanish speaking countries were chosen for this study, Spanish terminology varies among countries, Kramsch (1993) substantiates this with the statement that "language anchors culture in the very grammar we use, the very vocabulary we choose, the very metaphors we live by" (p. 8). Thus, the search for the specific animal biotechnology department, area, rectory, commission, dean's office, specialized office, and other terms, was complicated. One of the reasons to perform the search in alphabetical order of the countries, besides setting order in the search, was to be aware and get used to the terminology used in each country for their area of Animal biotechnology research.

8. Rewards - To improve response rates some incentives were given. Academic rewards were offered, through publishing the directory in a Texas A&M Web page with the names and contact information of the researchers.

Sample

A stratified random sample was used as the sample procedure for this study. Gall, Borg and Gall (1996) defined a random sample as "a group of research participants that is formed such that all members of the accessible or target population have an equal and independent chance of being selected" (p. 768). Eighty five participants were randomly chosen from the directory list. The Research Randomizer Web site developed by Urbaniak and Plous (2003) was used for the random sample in each country. Research Randomizer is a service offered to students and researchers interested in conducting random assignment and random sampling.

Instrumentation

An instrument was used to collect data and was sent via e-mail with personalized cover letters that included the purpose of the study plus the explanation of the reward the participants could attain (See APPENDIX G). The reward was academic, which allowed the respondents to be listed in a database in the animal biotechnology project Web site from Texas A&M University with a direct link to their Web Homepage. A scale of strongly disagree, disagree, agree and strongly agree was used in 23 items, all other items in the instrument were of multiple choice (See APPENDIX H for the instrument).

Short semi-structured e-mail interviews were developed in consultation with experts in test development and cultural knowledge and a review of other research studies related to this study.

The instrument items were based on many readiness surveys used widely in the U.S., and tested in two culture studies mentioned in the literature review (Banks, 2001; Hofstede, 1984). The study has an integrated quantitative and qualitative approach.

The instrument and e-mail interviews were approved by Texas A&M University's IRB office, and the researcher completed two courses required by the IRB office to be able to collect data from human subjects.

Instrument

The instrument was divided into 11 major areas and included 67 items with some items containing up to three questions for a total of 86 items.

Table 1 shows the instrument areas with the items that explain them. The instrument was develop and analyzed following a quantitative approach, and was reinforced following a qualitative method.

Cultural aspects, elements, dimensions and differences depend on one another and cannot be seen as independent variables. Each area emphasizes a specific cultural factor which is crucial on the analysis of an assessment (Table 1).

Table 1

Areas of Assessment Covered in the Instrument

Area	Sections/items
1. TECHNOLOGY	
a) Internet	a.1) *Availability*-**3, 4c** a.2) *Network Speed and Quality*-**3, 4** a.3) *Experience*-**15, 16, 17, 21, 61**
b) Technical Resources	b.1) *Hardware and Software*-**1, 2, 5, 6, 7, 8, 26, 38, 39, 40,** b.2) *Service and Support*-**10, 11, 12, 13, 14**
c) Computer Proficiency	*ComputerProficiency*-**19, 20, 25, 26**
d) Distance Education	d.1) *Experience*-**27, 28, 29, 30, 31, 34, 37** d.2) *Skills*-**26, 34, 37, 47, 50** d.3) *Interest*-**31, 44, 45, 46, 51, 66**
e) Instructional Design	*Experience*-**37, 47, 48, 50**
2. VALUES AND BEHAVIOR STYLES	
	Technology- **5, 9, 10, 11, 13, 14, 15, 18, 22, 24, 25, 33, 36, 45, 49, 51, 52**
3. LANGUAGE AND DIALECTS	
	English Proficiency- **45, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65 66, 67**
4. NONVERBAL COMMUNICATIONS	
	Distance Education-**34**
5. CULTURAL COGNITIVENESS	
	Culture-**22, 44, 47, 49, 52, 54**

Table 1 (Continued)

Area	Sections/items
6. PERSPECTIVES	
	Technology-**8, 9, 15, 16, 18, 42, 66, 46, 54**
	Distance Education-**28, 29, 30, 31, 33, 44, 51, 52, 53**
7. IDENTIFICATION	
	Distance Education-**33, 36, 38, 39, 40, 41,61, 65, 66, 67**
8. POWER DISTANCE	
	Organization-**32, 43**
	Communication-**22, 23**
	Academic-**35, 41, 45, 50, 51, 52**
9. UNCERTAINTY AVOIDANCE	
	Uncertainty-**20, 24, 32, 36, 41, 53**
10. INDIVIDUALISM/COLLECTIVISM	
	Dualism-**25, 35, 36, 44, 49, 53**
11. MASCULINITY/ FEMININITY	
	Qualitative section

1. Technology

The technology area was aimed toward the distance education area and was divided into five groups: (a) Internet, (b) Technical resources, (c) Computer proficiency, (d) Distance education and (e) Instructional design.

a) *Internet*- This group was composed of three sections: (a.1) Internet availability, (a.2) Network speed and quality, and (a.3) Internet experience:

a.1) Internet availability - Internet access is enhanced by competition among Internet Service Providers that operate locally. This group explains the use and

importance given to the Internet in a country, in institutions and by users. In recent years, adoption of Internet by institutions and individuals has increased enormously. Although Ngini, Furnell and Ghita (2002) affirmed that “the potential benefits are not uniformly available, and previous studies have indicated that an overwhelming majority of Internet use is concentrated within developed nations- thus adding another degree of separation to that already existing between these countries and other parts of the world” (p. 329). They published the results of a study developed by Nua Surveys in 2001 were it was found that from the 513.4 millions of Internet users only 4.93 % were in Latin America. Meanwhile the U.S. and Canada had 35.19% of the users. This broadens the disparity among these nations. One of the main factors that influence Internet availability in a country is infrastructure. Telecommunications infrastructure is needed in Latin America, although the costs are enormous, thus many governments use the private sector. Ngini, Furnell and Ghita claimed that a metric used to indicate the extent of a country’s connectivity infrastructure is teledensity, which indicates the number of telephone lines for every 100 people. Latin America, according to Paul Budde Communications (2006) has 18%, while the U.S. has over 60%.

a.2) Network speed and quality - The available bandwidth, determines the number of users and types of online activities the network can support. The quality of the network, including servers, also determines its usage. The items in this group expose the relationship between Internet connection and how the

participants perceive them, providing information about the level of technological advances in their institution.

a.3) Experience - Internet experience was assessed in this group of items, starting with the time and type of usage. The United Nations Development Programme (1999) stated that “The typical Internet user worldwide is male, under 35 years old, with a college education and high income, urban-based and English-speaking— a member of a very elite minority worldwide” (p. 63).

b) *Technical Resources* - This group was composed of two sections: (b.1) Hardware and software, and (b.2) Service and support:

b.1) Hardware and Software - Software is one of the fastest-growing areas of the industry and some programs are used widely among all the sectors of society. Certain programs usage could show the level of technological advance. The type of technological and technical resources and its usage was assessed in this section, such as knowledge of multimedia, hypermedia, and telecommunications activities.

b.2) Service and Support - A strong support service orientation is important in determining the success of network deployment. Long waiting periods for installation and repair and a lack of support services by telephone companies and Internet providers pose major obstacles to readiness. The quality and existence of technical support professionals are essential in maintaining a network and providing service. This section assessed the usefulness of service and support considered in animal biotechnology organizations of Latin America.

c) *Computer Proficiency* - Assessed how comfortable researchers were using a computer, how often they use the computer, and the most common programs used.

d) *Distance Education* - This assessment was divided into three sections: (d.1) Experience, (d.2) Skills and (d.3)Interests:

d.1) Experience - The items asked about researcher's experience with distance education (online, by mail, videoconference, CD-ROM, desktop videoconference, or other) and how their experience with the Learning Management System used and owned by their organizations.

d.2) Skills - This section is intrinsically bonded with experience in distance education and answers should be consistent with one another; skills and knowledge of the basic principles of distance education were assessed in this section.

d.3) Interest - It is not only a matter of knowledge and experience, but researchers also need to be interested in this area to be able to develop it.

e. *Instructional Design* - This is the last item for the assessment of technology and determined the experience researchers in animal biotechnology have had with instructional design.

2. Values and behavior styles

The first element of culture for Banks (2001) is Values. Values are abstracts and generalized principles of behavior with high worth attached by members of a society acquired by socialization. The questions intended to expose these elements are

intrinsically related and shared with Hofstede's (1984) power distance and individualism/collectivism dimensions. It also measures the relationship of technology with distance education.

3. Language and dialects

Language and dialects is another cultural element (Banks, 2001). English proficiency and its perception were mainly assessed. Researchers were asked about their English skills and abilities. Kramsch (1993) argued that language reflects a person's belief system, values, and comprehension of the world. Assessing English proficiency is difficult if cultural characteristics are not considered. Some cultures do not admit deficiencies. The United Nations Development Programme (1999) declared that 80% of the Websites on the Internet are in English, yet less than one in ten people worldwide speak the language. Gomez (2004) stated that recent studies assert a small growth of Web sites in Spanish, but this expansion is negligible compared with the explosion of information available in English. As mentioned before, the majority of Internet users worldwide speak English as a native language, but the proportion of non-native English speakers has been steadily growing. By the end of 2000 there were more non-native than native English speakers using the Internet. "Nonetheless, English continues to be the dominant language on the Internet, with between 70 and 80 percent of all content in English, and only 1.5 percent in Spanish" (p. 72).

Through the study of other languages, people gain a knowledge and understanding of the cultures that use the language (Standards for Foreign Language Learning, 1996). Thus it is important to measure it from an academic perspective.

The items for this area were written in English. This allowed the researcher to ask some questions directly, to see if it was understood.

4. Nonverbal Communications

This element from Banks' (2001) study was assessed using both qualitative and quantitative approaches. Communication is far more than speech and writing. Most of the people are unaware that they are communicating in many different ways even when they are not speaking.

5. Cultural Cognitiveness

Cultural cognitiveness (Banks, 2001) was assessed with both qualitative and quantitative approaches. Here the items were shared with other areas, emphasizing how researchers view their technology development at work related with their culture.

4. Perspectives

Perspective is another of Banks' (2001) cultural elements, and it was divided into two groups:

a. *Perspective of technology* - This group of items measured how researchers perceived academic and computer technologies, and its use.

b. *Perspectives of distance education* - Distance education has existed in Latin America for a long time. It started with mail, radio and television courses, and now it has being updating with the available technology in these countries.

6. Identification

Identification is the last of Banks' (2001) cultural elements and it refers to how an individual identifies with their culture, feels part of the group, internalizes its goals,

interests, aspirations, values and standards. The items in this area aim to measure how researchers identify with their institution when dealing with international projects, distance education, Internet, and English as a basic research tool.

Identification gives an emphasis in researcher's identification with distance education, its basic principles and the way they are developed in their institution.

7. Power Distance

Power distance is one of Hofstede's (1984) elements of culture. This dimension relates to a culture's willingness to accept a difference in power over other members of the culture. Thus, high power distance cultures tend to be willing to accept differences in the distribution of power across cultural members. However, low power distance cultures will strive for an equal distribution of power. Power distance area was divided into three groups:

a. *Organization* - The items in this group intend to measure how power distance is in the researcher's organization. As Hofstede (1991) stated:

> Organizing always demands the answering of two questions: (1) who has the power to decide what? and (2) what rules or procedures will be followed to attain the desired ends? The answer to the first question is influenced by cultural norms of power distance; the answer to the second question, by cultural norms about uncertainty avoidance (p. 140).

b. *Communication* - Communication is a strong tool for power, and it demonstrates how power distance is distributed. The elements of the communication process are influenced by culture and culture will thus influence the appropriateness of

the message. Who can communicate with whom will be answered differently in different cultures. The items here relate not only to how researchers communicate, but their relationship with communication technologies (Steinwachs, 1999).

c. *Academic* - Power among the academic world has a unique development in Latin America. The purpose of these items was to measure how power is distributed and accepted in the academic area.

9. Uncertainty Avoidance

Uncertainty avoidance is another of Hofstede's (1984) dimensions and it could have an influence on the use of information for learning. Hofstede's (1991) research has shown that members of strong uncertainty avoidance cultures like learning situations in which there is one correct answer to be found. The teacher is expected to be the expert. In these cultures, the main information source used will be that used or recommended by the teacher, so that the external information-seeking activity will be limited. The items in this area were aimed to measure how Latin American cultures tend to control uncertainty.

10. Individualism/Collectivism

Hofstede (1984) established this as another dimension, and it refers to the relationship of the interests of the individual with the interests of the society. Items in this group measured this relationship.

11. Masculinity/Femininity

The masculinity/femininity duality is another of Hofstede's (1984) dimensions and it is grounded in the ways sex roles are allocated in the culture. Simon (2001) summarized this duality "Some cultures minimize the distinctions between sex roles, emphasize the quality of life, and are categorized as 'feminine.'… Others maximize the distinctions between the sex roles, highlight the quantity of life, and are labeled 'masculine'" (p.23).

This dimension was assessed though the qualitative approach.

Non-Respondent Treatment

A non-response treatment was used as follows: One week after the first e-mail, a second e-mail was sent, and one week later, a third e-mail was sent to participants that had not responded. After one week from the third e-mail, participants were considered a non-respondent and a fourth and last approach was made to each of them. Responses received after the last e-mail, were considered as representative from that group of non respondents.

Pilot Test

The instrument was pilot tested in three universities in Mexico, with six researchers from the biological area, one from a distance education department and one with graduate studies in education. The suggestions and difficulties observed were reviewed and the instrument was changed accordingly. During the pilot testing the

participants were contacted via e-mail and followed by a telephone interview to clarify information and data collected. Two of the researchers were visited in person.

Eighty seven percent of the suggestions were to simplify or change some of the items' construction to avoid misunderstandings. All the participants in the pilot test suggested that the formality of the written document had to be lighter, meaning that instead of referring to the participants in the third person, it should be in a friendly second person. Amir (2005) confirmed this "using a third person writing style makes the client an anonymous figure and creates a distance between the reader and what he/she reads" (¶24).

Another suggestion was to simplify the terminology, although the distance education and education specialists confirmed the terminology used was appropriately applied.

The instrument included 67 items, with some items containing up to three questions, for a total of 86 items. All the pilot test participants answered it in less than 15 minutes. Therefore, the length of the instrument was appropriate.

Data Collection

Data collection came from two sources, an instrument sent via e-mail and a short e-mail interview.

Instrument

A survey with quantitative and qualitative approaches was used for data collection. Due to the geographical location of the participants (sixteen Latin American Countries) the instrument was sent and retrieved through e-mail. According to Gall, Borg and Gall (1996) surveys in the form of questionnaires sent to participants via e-mail, have two advantages: the cost of sampling respondents over a wide geographic area and the time required to collect data are low.

The instrument's items had multiple choices for answers with a choice of "none of the above."

E-mail Interviews

A first contact with the potential participants via e-mail was made before sending the instrument. This first contact was to confirm their acceptance to be part of the study and the directory, to update contact information, and exchange information to establish rapport with participants. One of the purposes for conducting interviews was to obtain understanding of persons, events, activities, organizations, feelings, motivations, etc. (Lincoln & Guba, 1985). According to Erlandson, Harris, Skipper and Allen (1993), interviews help to understand and put into a larger context the interpersonal, social, and cultural aspects of the environment the participants are embedded into.

E-mail interviews proved to be an important complementary data gathering technique because of one of its characteristics: flexibility. This feature allowed the

researcher to mold the interview depending on the participant's interest, needs, information, etc.

All data was stored in digital form and hard copies were also kept as backup.

Peer Debriefing

Lincoln and Guba (1985) described a peer debriefer as "someone who is in every sense the inquirer's peer, someone who knows a great deal about both the substantive area of the inquiry and the methodological issues" (p. 308). A Latin American researcher with background in the biological area, with a degree in education made him appropriate candidate.

The researcher met with the peer debriefer after developing the instrument and e-mail interviews every week to review responses.

Confidentiality

The participants were offered confidentiality in all the e-mail contacts and they were informed that by answering the instrument they were accepting to participate, even though they sent an acceptance e-mail prior to receiving the instrument. To ensure confidentiality: (1) participant's names and countries were coded; (2) the observations were translated to English omitting details that could attribute quotations to specific individuals and (3) details were omitted that could identify any of the participants.

Data Analysis

Bogdan and Biklen (1992) stated that “data analysis is the process of systematically searching and arranging the interview transcripts, field notes, and other materials that you accumulate to increase your own understanding of them and to enable you to present what you have discovered to others” (p. 153). The data were analyzed considering quantitative and qualitative approaches.

Quantitative

For the quantitative approach the data was processed using the Statistical Package for the Social Sciences (SPSS) version 14.0 using descriptive statistics. Hafner (1998) defined descriptive statistics as a method for summarizing, organizing, and presenting information. Descriptive statistics included central tendency variables (such as mean, percentages and mode), cross-tabulation, and standard deviation.

Qualitative

The interviews were analyzed and coded using methods based upon grounded theory, in line with the principles of Glaser and Strauss (1967). They assert grounded theory as a qualitative approach which could be used to analyze social processes that are present within human interactions. Application of the theory results in explanations of important social processes or structures that are derived (grounded) in the empirical data. The grounded theory approach is based on the idea that a group or groups share specific social psychological problems that are not necessarily articulated (Glaser & Strauss).

Grounded theory is a form of field-studies that systematically applies procedural steps to develop an exploration about a particular phenomenon.

Semi-structures interviews via e-mail were conducted and in order to ensure the trustworthiness, three techniques were employed including, storing the data (in electronic media) peer debriefing and audit trail.

To better understand the perceptions of the participants, quotations from the semi structured interviews were included. The coding of each participant was added in brackets immediately after each quotation, to assure confidentiality and as the method of audit trail to be able to trace the original data source.

CHAPTER IV

DATA ANALYSIS AND RESULTS

This chapter was divided into two sections: (a) population and sample, and (b) results by instrument area.

Population and Sample

The Latin American animal biotechnology directory was the population of the study (N=150). The stratified sample was 60% of the population (n=90) and was selected randomly. Six participants had an invalid e-mail, thus, they were deleted and the sample was n=84, representing 56% of the population. Table 2 shows the distribution of the population by countries, and the percentage of each country in the directory (population).

Table 2

Distribution of Population by Countries

Country	Directory Researchers	%
Argentina	24	16.00
Bolivia	4	2.67
Chile	13	8.67
Colombia	10	6.67
Costa Rica	19	12.67
Ecuador	4	2.67
El Salvador	4	2.67
Guatemala	7	4.67
Honduras	11	7.33
Mexico	26	17.33

Table 2 (Continued)

Country	Directory Researchers	%
Nicaragua	5	3.33
Panama	3	2.00
Paraguay	1	0.67
Peru	5	3.33
Uruguay	10	6.67
Venezuela	4	2.67
Total	150	100.00

The first e-mail sent to the participants with the instrument had 22 participants respond (26.5%). The second e-mail had 30 participants respond (36%). The third e-mail had 27 participants respond (32%). Five participants were considered non-respondents. Total responses represented 95% of the sample (Table 3).

E-mail semi-structured interviews were conducted with 20 researchers (APPENDIX A). Seven of them sent documents with information about the state of biotechnology in their countries and others sent information about their research work. A representative of one of the most important biotechnology networks (Redbio) requested the information in the directory to incorporate in their database. Many other participants said they wanted to have access to the results of the present study. It was interesting to observe that when developing the directory, many biotechnology researchers who did not belong to the animal area expressed interest in the study and offered to help if necessary.

Table 3

Instrument Responses

Instrument	Responses	%
1st e-mail	22	26.00
2nd e-mail	30	36.00
3rd e-mail	27	32.00
Non-respondents/4th e-mail	5	5.00
Subtotal	84	100.00

Results by Instrument Area

The instrument was divided into 11 major areas related to technology and two culture theories (Banks, 2001; Hofstede, 1984). Each area was analyzed and the results are provided in the following sections:

Technology

The technology area on the instrument was divided into five groups: (a) Internet, (b) Technical resources, (c) Computer proficiency, (d) Distance education and (e) Instructional design.

Internet

Internet assessment considered Internet availability, network characteristics and researchers preparedness with the Internet. This section was divided in three parts which provided information about infrastructure in Latin American animal biotechnology institutions.

The majority of the researchers had good Internet connections that would provide the capacity to participate in distance education programs. All those with good network connections considered their Internet fast. However, perceptions about speed did not relate to the type of Internet connection. It was also found that most researchers had experience with the Internet, browsing the Web for work related issues, communication, and research.

Internet Availability. Table 4 shows the items assessed for this section. The home Internet connections were considered here, because it showed preparedness of the researchers for distance education.

Seventy percent (n=59) of the respondents declared to have cable, satellite or DSL connections. Participants claimed to have this kind of Internet connection due to convenience (48%), speed (21%), or availability (24%).The minority had slow connections (dial-up= 2%) because of cost.

Table 4

Items of the Internet Availability Section

Statement	**N**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**
		Dial-up		Cable		DSL		Satellite	
What kind of Internet access connection do you have at home?	84	2	0.02	22	0.26	25	0.30	12	0.14
		Other		Don't have					
		16	0.19	7	0.08				
		Availability		Cost		Convenience		Speed	
You have this kind of Internet connection because…	80	19	0.24	6	0.08	38	0.48	17	0.21

Network Speed and Quality. This section included questions about the speed and type of the Internet connection and the reason for this type of connection. Table 5 shows the items of the instrument assessed for this section.

A correlation between the type of Internet connection and how they considered the connection showed a weak negative association (r=-.439), although at a 0.01 level correlation was significant (2-tailed).

Table 5

Items of the Network Speed and Quality Section

Statement	N	*f*	%	*f*	%	*f*	%	*f*	%
		Dial-up		Cable		DSL		Satellite	
What kind of Internet access connection do you have at home?	84	2	0.02	22	0.26	25	0.30	12	0.14
		Other		Don't have					
		16	0.19	7	0.08				
Your Internet access connection is…	84	Fast		Acceptable		Slow			
		41	0.49	36	0.43	7	0.08		
You have this kind of Internet connection at home because…	80	Availability		Cost		Convenience		Speed	
		19	0.24	6	0.08	38	0.48	17	0.21

DSL users (30%, n=25) considered their connection fast, and they declared to have that connection due to speed (17 of the 25= 68%) and convenience (32%). Cable and satellite users (40%) had that connection due to convenience (15 of the 34=44%) and availability (56%). Participants that stated their connection was fast (49%, n=40) were mainly DSL users (38%, n=30). Nine researchers (11%) stated to have another type of Internet connections. In the interviews five researchers said they had T1 type Internet

connections, which is one of the fastest available connections. It was interesting to note that two dial-up users considered their connection fast.

Internet Experience. This section was assessed through five items of the instrument shown in Table 6.

Researchers stated that they had considerable to high Internet experience (96%, n=81), 30 were comfortable downloading programs and installing them on their computers, and 75 felt comfortable surfing the Web in English.

A cross-tabulation through SPSS (version 14.0) was developed between the questions: “How often do you browse the Web?”, “For what purpose?”

When browsing the Web several times a day, 71 (85%) declared the purpose as work related, 26 (31%) for general knowledge, 71(85%) for e-mail and personal matters, 10 (12%) for shopping, 47 (56%) for research and 10 (12%) for chat and downloading programs.

The cross-tabulation confirmed that most researchers had experience with the Internet, although less than half trusted the Web in technology applications. Nevertheless, from the ones that rated low Internet experience (n=3) all were comfortable downloading and installing programs from the Internet.

Table 6

Items of Internet Experience Section

Statement	N	*f*	%	*f*	%	*f*	%	*f*	%
How often do you browse the Web?		Rarely		Several times a day		Once a day		Every other day	
	84	2	0.02	72	0.86	2	0.02	8	0.10
What is the purpose for accessing the Internet?		Work Related		General Knowledge		E-mail/ personal		Shopping	
	84	74	0.88	27	0.32	84	1.00	11	0.13
		Research		Chat/ Download Programs					
		59	0.70	17	0.20				
Are you comfortable downloading software from the Internet and installing it on your computer?		Yes		No					
	84	30	0.36	54	0.64				
What is your level of experience with the Internet?		Use and understand how to find, evaluate, and bookmark websites.		Use a 'point and click' strategy.					
	84	81	0.96	3	0.04				
I am comfortable Surfing the Web in English.		Strongly Disagree		Disagree		Agree		Strongly Agree	
	80	0	0.00	2	0.03	38	0.48	40	0.50

Another cross-tabulation was developed (see Table 7) to measure the association of the purpose of Web browsing. E-mail and personal matters browsing had the major association (n=169), closely followed by work related browsing (n=168). Research browsing had 146 associations, general knowledge 124, with a larger gap for use such as shopping, chat and download (41 and 40 associations respectively). Internet experience was prevalent among the participants with communication, research, and job related browsing common among them.

Table 7

Cross-Tabulation on the Purpose for Browsing the Web

	Work Related	General Knowledge	E-mail & Personal	Research	Shopping	Chat and Download Programs	Total
General Knowledge	26	-	56	26	7	9	124
E-mail and Personal	73	26	-	50	10	10	169
Research	49	26	50	-	11	10	146
Shopping	10	7	10	11	-	2	40
Chat and Download Programs	10	9	10	10	2	-	41
Work Related	-	26	73	49	10	10	168

Technical Resources

When dealing with distance education projects it is crucial to be aware of the technical resources the participants have because from that point the establishment of needs and objectives would be determined. The area of technical resources was divided into two sections: (a) hardware and software; and (b) service and support.

Referring to hardware and software all the participants had access to a personal computer. Computer processors and operating systems were viewed as current. Similarly, the majority of the participants declared to have support services, for technology practice and maintenance.

Hardware and Software. This section was assessed through 12 items of the instrument shown on Table 8.

It is basic to determine if participants have personal computers or had access to one, seventy researchers (83%) declared to have personal computers, with the rest (17%, n=14) having access to one. From the ones that declared to have a personal computer, 27% (n=19) shared it with another person. In the interview some of these researchers said that they shared with their assistants. Eight (57%) participants did not have a personal computer and had to share it with another researcher. Six (43%) had to share it with more than three and up to nine researchers.

Interviews exposed that researchers did not keep important and sensitive information stored on those computers and that they used other computer storage devices. All the researchers who shared with more than three researchers stored their data on USB flash drives; only seven (50%) kept some information on the hard drive. From the participants with personal computers, 66 (94%) saved their data on hard drive plus another medium, 65 (93%) used USB flash drives, three (4%) used zip drives, six (8%) used diskettes, 37 (53%) used CD/DVD’s and two (3%) used other types.

Table 8

Items of the Hardware and Software Section

Statement	N										
Do you have a personal computer at work?	84	Yes		No							
		70	0.83	14	0.17						
If not, Do you have access to a computer at work?	14	Yes		No							
		14	1.00	0	0.00						
What operating system does the computer have?	84	Windows 98		Windows XP		Other		Don't know			
		10	0.12	65	0.77	2	0.02	7	0.08		
At work, how many computers per researchers are in the lab?	84	Personal		Shared							
		50	0.60	34	0.40						
Do you consider the computers in the lab:	84	Outdated		Common		Up to date		State of the art			
		9	0.11	32	0.38	34	0.40	9	0.11		
Are the processors in the computers at work?	84	Celeron		Pentium 1-3		Pentium 4		Pentium D		Don't know	
		6	0.07	13	0.15	31	0.37	12	0.14	22	0.26
What do you use to store your information?	84	Hard Drive		Zip drive		USB Flash drive		Diskette		CD/ DVD	
		74	0.88	3	0.04	72	0.86	6	0.07	39	0.46
Are you familiar with the following programs?		Yes		No		Every day		Weekly		Occasionally	
		f	%	*f*	%	*f*	%	*f*	%	*f*	%
Power Point	84	84	1.00	0	0.00	22	0.26	43	0.51	19	0.23
Word	84	84	1.00	0	0.00	84	1.00	0	0.00	0	0.00
Excel	84	83	0.99	1	0.01	30	0.36	31	0.37	22	0.26
FrontPage	84	21	0.25	63	3.00	1	0.01	7	0.08	13	0.15
Producer	84	1	0.01	83	83.00	0	0.00	0	0.00	1	0.01
Flash	84	22	0.26	62	2.82	3	0.04	1	0.01	18	0.21
Dream Weaver	84	5	0.06	79	15.80	2	0.02	3	0.04	0	0.00
Authorware	84	3	0.04	81	27.00	1	0.01	0	0.00	2	0.02
Photoshop	84	56	0.67	28	0.50	6	0.07	9	0.11	41	0.49
Acrobat (.pdf)	84	83	0.99	1	0.01	53	0.63	19	0.23	11	0.13
Illustrator	84	14	0.17	70	5.00	2	0.02	3	0.04	9	0.11
Does your institution have a membership with any LMS in the market?	84	Yes		No							
		29	0.35	55	0.65						
If yes, does your institution have a membership with any learning management system in the market?	29	WebCt		Angel		Blackboard		Don't know			
		2	0.07	1	0.03	3	0.10	23	0.80		
Does your department have access to the Learning Management System?	84	Yes		No		Don't know					
		34	0.40	28	0.34	22	0.26				
Do you consider your institution to be equipped in computer technology?	84	Very much equipped		Equipped		Somewhat equipped		Essential/ minimum		Not at all	
		27	0.32	25	0.30	21	0.25	7	0.08	7	0.08

Types of computer processors and operating systems were cross-tabulated and results shown on Table 9. Pentium 4 (n=27), Pentium D (which is a later version of computer processor than Pentium 4) (n=11) and later (n=1) processors had mainly Windows XP operating systems. Six Pentium 1-3 processors had Windows XP installed and Table 10 shows how Pentium 4 was scored as common by 16 participants, as up to date by 13 with only one as state of the art. Pentium D was scored as common by nine researchers, as up to date by two and one scored it as state of the art. A later processor than those included in the instrument was scored as up to date.

Table 9

Cross-tabulation of Operating Systems and Computer Processors

		Processors						
		Celeron	Pentium 1-3	Pentium 4	Pentium D	Later	Don't know	Total
Operating Systems	W-98	6	0	2	0	0	2	10
	W-XP	0	6	27	11	1	20	65
	Other	0	0	1	1	0	0	2
	Don't know	0	7	0	0	0	0	7
	Total	6	13	30	12	1	22	84

Table 10

Cross-tabulation of Computer Processors and Computer Ratings

		Computers ratings				
		Outdated	Common	up to date	State of the art	Total
Processors	Celeron	0	6	0	0	6
	Pentium 1-3	9	1	3	0	13
	Pentium 4	0	16	13	1	30
	Pentium D	0	9	2	1	12
	Later	0	0	1	0	1
	Don't know	0	0	15	7	22
Total		9	32	34	9	84

The items from the instrument that dealt with computer operating systems processors were cross-tabulated with how the computers were rated as up to date. The researchers who believed their institution was very much equipped (32%, n=27) had considered the computers common by seven (26%), up to date by 11 (41%), and state of the art by nine (33%). The participants that considered their institution equipped (n=25, 30%) believed computers were common (24%, n=6) and 19 (76%) believed they were up to date. The ones that considered their institution somewhat equipped scored the computers as common (82%, n=16), four (16%) as up to date, and one outdated. The participants that believed their institution were not equipped (n=7, 8%) considered their computers outdated.

Assessment about software considered the most common for distance education indicated that all were familiar with Microsoft PowerPoint, Word, Excel, and Adobe Acrobat. Microsoft Word was used every day by all of them, while PowerPoint by 22 (26%), Excel by 30 (36%), and Adobe Acrobat by 53 (63%). Web page creation software was not very familiar to the researchers (FrontPage by 21 (25%) and Dreamweaver by only five (6%)). Programs to create educational items were also unfamiliar to the participants. Producer (1%), Authorware (4%) and Flash were a little more common with 26% (n=22). Image editors scored 67% for Photoshop and 17% for Illustrator.

Twenty nine researchers (35%) declared that their institution had a membership with a Learning Management System in the market, although the majority did not know which one.

Service and Support. Service indicates the kind of support that computer technologies had in the researchers' institution. Table 11 shows the four items used to assess this section.

Sixty six participants (79%) declared to have Internet technical support, with 57 (86%) having contacted them more than once. Fifteen respondents (26%) rated their technical support as very efficient, 28 (49%) as somewhat efficient, 14 (25%) as efficient, and none considered them inefficient. Sixty nine (82%) stated they had a technical support department; three of these departments did not give Internet technical support. The ones that did not have a technical support department (n=15, 18%) turned mainly to a coworker who was computer savvy (n=8, 53%) for support.

Table 11

Items of the Service and Support Section

Statement	N	*f*	%	*f*	%	*f*	%	*f*	%
Do you have Internet technical support from work?	84	Yes		No					
		66	0.79	18	0.21				
Have you contacted them to solve any problem?	66	1+		Never					
		57	0.86	9	0.14				
How would you rate it?	57	Very efficient		Somewhat efficient		Efficient		Inefficient	
		15	0.26	28	0.49	14	0.25	0	0
Do you have a technical support department at work?	84	Yes		No					
		69	0.82	15	0.18				
If not, what do you use for technical support at work?	15	Private expert		Co-worker		Original service		No one	
		3	0.21	8	0.53	2	0.13	2	0.13

Computer Proficiency

This section assessed how comfortable researchers were using a computer, how often they used the computer, and the most common programs used. Four items on the instrument were used for this assessment (Table 12).

The majority of the participants was able to perform the most common computer tasks and looked forward to learning new technologies. However, familiarity with software specific for distance education programs was scarce.

Comfort level with computers was asked. Ninety five percent (n=80) were able to perform the most common computer tasks, such as installing and running applications and managing files. The rest (4%) sometimes needed help to perform these tasks. Seventy nine percent (n=66) looked forward to learning some new software or other technologies, while 32% (n=27) felt apprehensive, but eventually learned it. When help was needed to perform a computer task, 48% (n=45) declared to use tutorials and 52% (n=48) asked for help. None stated that they would give up.

The use of and familiarity with software programs was also assessed as computer proficiency. The most common word processing and data processors found were Microsoft Word and Excel. Presentation creator (Microsoft Power Point) and secure files creator (Adobe Acrobat) were commonly used by the participants. The image editor Photoshop was recognized by 67%. The rest of the programs used to create Web pages and educational objects were not popular among the researchers.

Interviews indicated that the researcher did not have the need to use this last group of programs. Only a few (n=2) stated that these programs were part of their every day work life.

Table 12

Items of the Computer Proficiency Group

Statement	**N**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**
What is your comfort level with computers?	84	I can install and run applications and manage files		I sometimes need help		I am not comfortable using a computer					
		80	0.95	4	0.05	0	0.00				
How do you feel when asked to learn to use some new software or other technology?	84	I usually look forward to learning something new and can teach myself		I am usually apprehensive, but can eventually learn it		I try to avoid it and can only learn it if someone shows me					
		66	0.79	27	0.32	0	0.00				
If you need help performing a task on a computer you will?	93	Use tutorials		Ask for help		Give up					
		45	0.48	48	0.52	0	0.00				
Are you familiar with the following programs?		Yes		No		Every day		Weekly		Occasionally	
	N	***f***	%	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**
Power Point	84	84	1.00	0	0.00	22	0.26	43	0.51	19	0.23
Word	84	84	1.00	0	0.00	84	1.00	0	0.00	0	0.00
Excel	84	83	0.99	1	0.01	30	0.36	31	0.37	22	0.27
FrontPage	84	21	0.25	63	0.75	1	0.01	7	0.08	13	0.15
Producer	84	1	0.01	83	0.99	0	0.00	0	0.00	1	0.01
Flash	84	22	0.26	62	0.74	3	0.04	1	0.01	18	0.21
Dream Weaver	84	5	0.06	79	0.94	2	0.02	3	0.04	0	0.00
Authorware	84	3	0.04	81	0.96	1	0.01	0	0.00	2	0.02
Photoshop	84	56	0.67	28	0.33	6	0.07	9	0.11	41	0.49
Acrobat (.pdf)	84	83	0.99	1	0.01	53	0.63	19	0.23	11	0.13
Illustrator	84	14	0.17	70	0.83	2	0.02	3	0.04	9	0.11

Others (n=5) said they had someone to create what they needed as assistants or in the specialized department in their institution. One stated “I prefer to pay someone to do

this for me, because my work load does not allow me to spend time first learning the programs and then developing what I need" [CRSG].

Distance Education

The distance education area was divided into three sections: experience, skills and interest.

Only one third of the participants had previous experience with distance education. The participant roles in programs of distance learning were mainly as students, facilitators and authorities. Only one declared to be a designer. Skills were responded with most the researchers been familiar with adult education learning theories and all agreeing to introduce critical thinking into the learning process. All researchers were interested, and found important collaboration in multicultural learning settings to improve the learning environment. The majority perceived that education delivered at a distance was not the best option for learning, even when most researchers stated that education was transforming towards the use of technology.

Experience. In a distance learning project, experience in distance education provided the necessary information to develop and adjust the starting point, level, and expectations of the project. This section was assessed through six items of the instrument and it is illustrated in Table 13.

Thirty seven percent (n=31) of the participants had previous experience with courses delivered at a distance. From these, 31 participants, 15 (43%) were online, 16

(46%) through videoconference, three (9%) by video tape, and one by CD-ROM. Fourteen (73%) of the online courses, 11 used Whiteboard as the platform with two (13%) using WebCT, and one using Blackboard.

The 31 researchers that had distance education experience participated as students (38%, n=12), as facilitators (31%, n=10), as authorities (28%, n=9) and one as the designer.

Table 13

Items of the Distance Education Experience Section

Statement	**N**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**
Have you previously participated in a course delivered at a distance using technology?	84	Yes		No					
		31	0.37	53	0.63				
If yes, how was the course(s) delivered	35	Video tape		CD-ROM		Online		Video conference	
		3	0.09	1	0.03	15	0.43	16	0.46
If it was online, what Learning Management System did you use?	15	Whiteboard		Don't know		WebCT		Blackboard	
		11	0.73	1	0.07	2	0.13	1	0.07
How did you participate in a course delivered at a distance using technology?	32	Designer		Authority		Facilitator		Student	
		1	0.03	9	0.28	10	0.31	12	0.38
Have you ever created a Web page?	84	Yes		No					
		22	0.26	62	0.74				
Have you ever created media to place it in the Internet	84	Yes		No					
		41	0.49	43	0.51				

Skills. Skills have to do with preparedness and are necessary for a successful distance education venture. This section was assessed through four items of the instrument shown in Table 14.

Twenty two participants (26%) declared to have created a Web page and 49% (n=41) to have created media to be placed on the Internet. Interviews exposed that mainly the content was developed by the researchers and some participated in the design, but almost all declared to have a great deal of expert help to achieve the creation of the media and Web pages.

Adult learning theory was a fundamental concept for developing distance education among adults with 83% (n=70) agreeing to be familiar with it. Critical thinking was also an essential knowledge base for distance learning with all participants subscribed to the value of introducing critical thinking into the learning process.

Table 14

Items of the Distance Education Skills Section

Statement	**N**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**
Have you ever created a Web page?	84	Yes		No					
		22	0.26	62	0.74				
Have you ever created media to place it on the Internet	84	Yes		No					
		41	0.49	43	0.51				
		Strongly Disagree		Disagree		Agree		Strongly Agree	
I am familiar with the concepts of adult education	84	2	0.02	12	0.14	34	0.40	36	0.43
I subscribe to the value of introducing critical thinking into the learning process	84	0	0.00	0	0.00	28	0.33	56	0.67

Interest. Interest in distance education was part of the motivation to participate successfully. This section assessed this through five items of the instrument shown in Table 15.

A distance education international project was expected to have classmates from different countries (at least the country provider and the receiver). That was why the question about a classroom with people from all over the world was included. All the researchers considered it a marvelous educational experience.

The most common distance education delivery strategies require writing proficiency. Ninety five percent (n=80) of the respondents declared to feel comfortable communicating in writing.

Sharing life, work, and educational experience in educational settings is a very important activity in adult education theory. All researchers agreed (18%, n=15) and strongly agreed (82%, n=69) that increased learning would take place through sharing their work, life, and educational experiences as part of the learning process. Ninety six percent of the participants stated to be aware that education is transforming towards the use of technologies.

Distance learning was considered by 45 (53%) as different from face to face and interviews showed these researchers perceived that at a distance, education was not ensured to be the best option for learning, because some claimed cheating could take place. The rest (n=39) considered equal scenarios for both delivery mediums. One participant added “we are adults, and if you are into something it is because you are interested. Besides distance learning offers many advantages for us, time, place, accessibility, etc” [COGH].

Table 15

Items of the Distance Education Interest Section

		Strongly Disagree		Disagree		Agree		Strongly Agree	
Statement	**N**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**
Having classmates from all over the country and around the world is a wonderful educational opportunity in itself.	84	0	0.00	0	0.00	18	0.21	66	0.79
I am comfortable communicating in writing.	84	0	0.00	4	0.05	33	0.39	47	0.56
I think increased learning will take place through sharing my work, life, and experiences as part of the learning process.	84	0	0.00	0	0.00	15	0.18	69	0.82
I consider distance learning is the same as face to face education.	84	6	0.07	39	0.46	33	0.39	6	0.07
Adult education is in a period of transformation.	80	1	0.01	2	0.03	37	0.46	40	0.50

Instructional Design

Instructional design was a basic tool for developing distance learning. Alessi and Trollip (1991) defined it as “the systematic process of translating general principles of learning and instruction into plans for instructional materials and learning” (p. 21). This area was measured through four items of the instrument (Table 16).

Even though sixty three percent of the participants claimed to have experience in instructional design, basic concepts for instructional design, such as adult education theories was common among researches and the creation of instructional pieces for the Internet was limited.

Table 16

Items of the Instructional Design Group

Statement	N	Strongly Disagree		Disagree		Agree		Strongly Agree	
		f	%	*f*	%	*f*	%	*f*	%
I am familiar with the concepts of adult education.	84	6	0.07	39	0.46	33	0.39	6	0.07
I have experience in instructional design.	84	6	0.07	25	0.30	37	0.44	16	0.19
I subscribe to the value of introducing critical thinking into the learning process.	84	0	0.00	0	0.00	28	0.33	56	0.67
Have you ever created media to place it in the Internet?	84	Yes		No					
		41	0.49	43	0.51				

Values and Behavior Styles

The values and behavior styles towards technology in distance education were assessed through the items shown on Table 17.

Results showed that there was a tendency to value technology as an essential tool for work and communication. Nevertheless, the respondents perceived degrees obtained online differently from the ones obtained face to face. In addition, most of the researchers felt comfortable interacting with other cultures.

As stated in the analysis of the technology area it was interesting to observe a high percentage of researchers that shared computers (40%), because in the semi-structured interviews. All pointed out, that computers were essential tools for research development and that they were a reliable medium to process research data.

For the type of e-mail account 88% (n=74) had a personal account and 10 shared an account at work or home ($\bar{x}$=0.12). E-mail was considered a “personal” medium of communication. Although a high percentage used e-mail to communicate at the job, they still considered face to face a basic way to communicate. In the interviews it was mentioned that interpersonal relations were based on direct communication and were basic for their way of lives.

Analysis indicated that tech support was valued as an important resource and that technology was an important area in the institution. From the researchers that stated not to have tech support (n=15) only two turned to the original computer service warranty. This is an important difference with customs in the U.S. where a high percentage of computer users use the original computer service warranty (Atkin & Jeffers, 1998).

When researchers needed to perform a task on the computer, 48 (57%) used tutorials and 45 (54%) asked for help. Nine (10.7%) used both methods and none of them gave up when dealing with computer tasks.

When assessing the values of the researchers about cultural differences, 63 (75%) participants did not think these differences could be a barrier for scientific information exchange, meaning that a minimum percentage, which though they meant a barrier, did not know how to interact with other cultures.

There was a tendency to view face to face and distance learning differently, which was consistent with viewing a degree online as not being equivalent to one obtained through traditional delivery. In the interviews, respondents asserted that they

Table 17

Items of the Values and Behavior Style Area

Statement	N	*f*	%	*f*	%	*f*	%	*f*	%
At work, how many computers per researchers are in the lab?		Personal		Shared					
	84	50	0.60	34	0.40				
Your e-mail account is:	84	74	0.88	10	0.12				
Do you have Internet technical support from work?		Yes		No					
	84	66	0.79	18	0.21				
Have you contacted them to solve any problem?		1+		Never					
	66	57	0.86	9	0.14				
Do you have a technical support department at work?		Yes		No					
	84	69	0.82	15	0.18				
If not, what do you use for technical support at work?	15	Private expert		Co-worker		Original service		No one	
		3	0.20	8	0.53	2	0.13	2	0.13
How often do you browse the Web?		rarely		Several times a day		Once a day		Every other day	
	84	2	0.02	72	0.86	2	0.02	8	0.10
Do you go to Internet Cafés to access the Internet?		Yes		No					
	84	15	0.18	69	0.82				
How comfortable are you doing important matters through e-mail and Internet?		All matters		Every day issues		Never			
	84	47	0.56	37	0.44	0	0.00		
How would you describe your work?		Full time career		Combined occupation					
	84	71	0.85	13	0.15				
If you need help performing a task on a computer you will:		Use tutorials		Ask for help		Give up			
	93	45	0.48	48	0.52	0	0.00		
International projects in my institution are…		Part		Rare		Do not exist			
	84	72	0.86	11	0.13	1	0.01		
I am comfortable communicating in writing		Strongly disagree		Disagree		Agree		Strongly agree	
	84	0	0.00	4	0.05	33	0.39	47	0.56
I think cultural differences among different countries can be a barrier for scientific information exchange.	84	31	0.37	32	0.38	16	0.19	5	0.06
I consider distance learning the same as face to face education.	84	6	0.07	39	0.46	33	0.39	6	0.07
An academic degree obtained online is equivalent to one obtained from traditional delivery.	84	11	0.13	41	0.49	28	0.33	4	0.05

felt traditional education (face to face) was “a more reliable way of learning” [1R15R]. Some said “in distance learning it is easier to cheat, you have to be really interested to do things appropriately” [G21CC].

Languages and Dialects

English language was seen by the researchers as an important tool to develop research. The majority of the participants asserted to read English fluently and understand it. More than half affirmed to be able to write articles in English and speak about their work.

English proficiency was assessed by four skills: reading comprehension, writing, speaking and listening. As viewed in Table 18, 5% of the participants (n=4) chose not to answer the English proficiency section of the instrument, consistent with their response about strongly agreeing that language is a barrier for scientific information exchange.

The reading comprehension skill was measured through five questions. Fifty seven participants (71%, SD=0.834, $\bar{x}$=1.61) declared to be able to read fluently (without the need of a dictionary), consistent with 62 (78% SD=0.509, $\bar{x}$=3.36) that stated they do not need translating. All stated they read articles in English, 98% (n=78, SD=1.011, $\bar{x}$ =2.30), and were comfortable surfing the Web in English. Sixty four (80%, SD=0.860, $\bar{x}$ =3.24) disagreed to avoid Web pages in English. Standard deviation for these items were small to the mean, meaning there was consistency among the respondents about reading comprehension.

The writing skills were assessed through two items of the instrument; 53 (67%, SD=0.949, $\bar{x}$=2.90) researchers affirmed they wrote articles in English, and only 29

Table 18

Items of the Language Area

		Strongly Disagree		Disagree		Agree		Strongly agree			
Statement	**N**	***f***	**%**	***f***	**5.00**	***f***	**%**	***f***	**%**	**Mean**	**SD**
I think language can be a barrier for scientific information exchange.	80	19	0.24	11	0.14	30	0.38	20	0.25	3.45	0.614
I can read in English without the need of a dictionary.	80	0	0.00	23	0.29	16	0.20	41	0.51	1.61	0.834
I read many articles in English.	80	0	0.00	0	0.00	19	0.24	61	0.76	2.65	1.080
I can communicate in English when I travel.	80	0	0.00	1	0.01	49	0.61	30	0.38	2.08	0.938
I can speak in English about my work fluently.	80	2	0.03	34	0.43	19	0.24	25	0.31	2.91	0.970
I can't speak technical English.	80	22	0.28	22	0.28	26	0.33	10	0.13	3.50	0.549
I can understand a native English speaker in a conference.	80	3	0.04	8	0.10	37	0.46	32	0.40	3.28	0.763
I am comfortable Surfing the web in English.	80	0	0.00	2	0.03	38	0.48	40	0.50	2.30	1.011
I write articles in English.	80	7	0.09	20	0.25	26	0.33	27	0.34	2.90	0.949
I have to translate English to Spanish to be able to comprehend.	80	22	0.28	40	0.50	8	0.10	10	0.13	3.36	0.509
I require English as a Second Language courses.	80	18	0.23	11	0.14	32	0.40	19	0.24	3.76	0.428
I avoid articles, Web pages and documents in English.	80	48	0.60	16	0.20	15	0.19	1	0.01	3.24	0.860
Adult education is in a period of transformation. This transformation can be traced to the use of technology in learning which is forcing educators to review 'what they do and how they do it.'	80	1	0.01	2	0.03	37	0.46	40	0.50	2.64	1.105
		Selection									
I rather not answer the English section	84	4	0.05								

participants (37%, SD=0.428, $\bar{x}$=3.76) claimed they did not need to take English courses.

The speaking skill was measured with three questions; 79 respondents (99%, SD=0.938, $\bar{x}$=2.08) stated they could communicate in English when they travel, but when asked about speaking about their work only 55% (SD=0.970, $\bar{x}$=2.91) affirmed to achieve it, and almost the same number of researchers stated they could speak technical English (n=44, 56%, SD=0.549, $\bar{x}$=3.5).

The listening skill was assessed with three items of the instrument; 69 (86%, SD=0.763, $\bar{x}$=3.28) stressed they understood English in a conference, and ten more (99%, SD=0.938, $\bar{x}$=2.08) claimed they achieved communication when traveling (meaning they could understand and speak English), although 29 (37%, SD=0.428, $\bar{x}$ =3.76) agreed to need English courses.

English was seen as an important tool to develop research. All these interviewed maintained that “to develop scientific research you have to have English proficiency” [V5VG]. One researcher said “you can claim not to need some of the skills such as speaking, but conferences are part of our job, and if you do not speak it, you are out of the picture and shot down” [P5B15]. Another stated that “the most recent research is always published in English. If you wait for it to be translated to Spanish and published you will be way behind the latest research news” [CHC1].

Nonverbal Communication

Nonverbal communication was another element of culture (Banks, 2001). It was assessed through two items of the instrument and complemented through semi structured interviews following a qualitative approach (Table 19).

All the researchers avowed that there were differences in nonverbal communications between the Latin American and the U.S. cultures.

Eighty researchers (95%) declared they felt comfortable communicating in writing, but when technology was involved, only 22 (26%) asserted they had created a Web page. Interviewees stressed that “Web pages are, in these days, a way to express yourself through your research or teaching” [B151Z]. Another commented “Our Web pages are more colorful and sometimes as complicated as our way of lives” [MXMB] which was consistent with some studies about differences in Websites between developed countries and developing countries (Hall & Hall, 1990; Zarir, Dobing & Hunter, 2002).

All those interviewed agreed that the Latin way to express in a nonverbal way was very different from the Americans. One researcher summarized by writing “Latin people are more polite. We do not express in the way U. S. researchers do. We act more politely or how it is said ‘we go around the bushes’” [MXM1]. Another researcher commented that “Americans at first sight are very friendly. They always smile, although in our culture too much smiles can be seen in another way, as flirting” [N9N15].

Table 19

Items of the Nonverbal Communication Area

Statement	N	Strongly Disagree		Disagree		Agree		Strongly Agree	
		f	**%**	***f***	**%**	***f***	**%**	***f***	**%**
I am comfortable communicating in writing	84	0	0.00	4	0.05	33	0.39	47	0.56
Have you ever created a Web page?	84	Yes		No					
		22	0.26	62	0.74				

Cultural Cognitiveness

Cultural cognitiveness was measured through the items shown on Table 20. Participants did not see cultural differences as a barrier for scientific exchange and that when they interacted with other cultures, awareness of their cultural practices took place.

All the respondents agreed that sharing a classroom with people of another country was a great educational opportunity (SD=0.413, $\bar{x}$=3.786). In the interviews, researchers said people became aware of their culture when they coexist with other cultures, and that learning goes beyond subject matters in a classroom. One researcher said “I did not realize how many words we use in Spanish until I had a working relationship with an American researcher. She would go right to the point, and I would use many paragraphs to get to the same objective” [P25FD]. This last comment was related to the question about language representing a barrier for information exchange. The majority (63%, SD=0.949, $\bar{x}$=2.9) felt language delayed scientific exchange. Nevertheless, when asked about cultural differences being a barrier for scientific

information exchange, 63 (75%) participants disagreed. Cultural factors could be overcome and language must be mastered to enhance scientific research.

Table 20

Items of the Cultural Cognitiveness Area

		Strongly Disagree		Disagree		Agree		Strongly Agree			
Statement	**N**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	**Mean**	**SD**
Having classmates from all over the country and around the world is a wonderful educational opportunity in itself.	84	0	0.00	0	0.00	18	0.21	66	0.79	3.786	0.413
I am familiar with the concepts of adult education	84	2	0.02	12	0.14	34	0.40	36	0.43	3.226	0.782
I think cultural differences among different countries can be a barrier for scientific information exchange.	84	31	0.37	32	0.38	16	0.19	5	0.06	1.952	0.917
An academic degree obtained online is equivalent to one obtained from traditional delivery.	84	11	0.13	41	0.49	28	0.33	4	0.05	3.763	0.428
I think language can be a barrier for scientific information exchange.	80	19	0.24	11	0.14	30	0.38	20	0.25	2.90	0.949
		All matters		Every day issues		Never					
How comfortable are you doing important matters through e-mail and the Internet?	84	47	0.56	37	0.44	0	0.00				

Zarir, Dobing and Hunter (2002) affirmed that “When technologies become available and cultures adopt them, the result can be either convergence, cultures becoming more similar, or divergence, when cultures adopt technology in different ways that maintain or even further accentuate their differences” (p. 210). Results of the use of

e-mail and Internet among the participants exposed how these technologies have been adopted in Latin America, although less than half did not use it to their full potential.

The concepts of adult education expose characteristics of adult learners, and people familiar with this theory become aware of the cultural factors that are involved, thus it was an appropriate measurement for cultural cognitiveness.

Perspectives

People within the same ethnic group (culture) often view reality in a similar fashion, as epistemological communities.

This area was assessed by 17 items of the instrument, making a distinction of perspectives on education, distance education and technology. Table 21 illustrates these items and the results from the assessment.

The factors that participants perceived as positive for their educational experiences included the sharing of experiences, international exchange, Internet availability and technological resources.

All of the respondents agreed that sharing their work, life and educational experience would increase the learning process. When added the language factor, 50 (63%) participants agreed it could represent a barrier for information exchange.

Only 32 researchers (38%) had participated in courses delivered at a distance. None of them rated their experience bad or poor, 13 (41%) rated it as a fair experience, and 59% (n=19) graded it as good or excellent. Most of the researchers agreed to spend

Table 21

Items of the Perspectives Area

		Strongly disagree		Disagree		Agree		Strongly agree	
Statement	**N**	*f*	%	*f*	%	*f*	%	*f*	%
I think increased learning will take place through sharing my work, life, and educational experiences as part of the learning process.	84	0	0.00	0	0.00	15	0.18	69	0.82
I think language can be a barrier for scientific information exchange.	80	19	0.24	11	0.14	30	0.38	20	0.25
Adult education is in a period of transformation.	80	1	0.01	2	0.03	37	0.46	40	0.50
Distance Education	**N**	*f*	$\bar{x}$	*f*	$\bar{x}$	*f*	$\bar{x}$	*f*	$\bar{x}$
I consider distance learning the same as face to face education.	84	6	0.07	39	0.46	33	0.39	6	0.07
An academic degree obtained online is equivalent to one obtained from traditional delivery.	84	11	0.13	41	0.49	28	0.33	4	0.05
I would be able to participate in an international academic exchange, where I get to spend time in another country.	84	1	0.01	2	0.02	42	0.50	39	0.46
Having classmates from all over the country and around the world is a wonderful educational opportunity in itself.	84	0	0.00	0	0.00	18	0.21	66	0.79
International projects in my institution are…	84	Part		Rare		Don't exist			
		72	0.86	11	0.13	1	0.01		
How did you participate in a course delivered at a distance using technology?	32	Designer		Authority		Facilitator		Student	
		1	0.03	9	0.28	10	0.31	12	0.38
How was your experience?	32	Bad/ Poor		Fair		Good		Excellent	
		0	0.00	13	0.41	17	0.53	2	0.06
Do you have a personal computer at home?	84	Yes		No					
		77	0.92	7	0.08				
What operating system does the computer have?	77	Windows 98		Windows XP		Other		Don't know	
		12	0.16	60	0.78	2	0.03	3	0.04
What kind of Internet access connection do you have?	77	Dial-Up		Cable		DSL		Satellite	
		6	0.08	20	0.26	24	0.31	3	0.04
		Other		Don't have					
		18	0.23	6	0.08				
Your Internet access connection is…	71	Fast		Acceptable		Slow			
		38	0.54	19	0.27	14	0.20		

Table 21 (Continued)

Technology													
Statement	**N**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**5**	***f***	**%**
Do you consider your institution to be equipped in computer technology?		Very much equipped		Equipped		Somewhat equipped		Just the essential/minimum		Not at all			
	84	27	0.32	25	0.30	21	0.25	7	0.08	7	0.08		
How often do you browse the Web?		rarely		Several times a day		Once a day		Every other day					
	84	2	0.02	72	0.86	2	0.02	8	0.10				
What is the purpose for accessing the Internet?		Work Related		General Knowledge		e-mail/ personal		Shopping		Research		Chat/ Download programs	
	84	74	0.88	27	0.32	84	1.00	11	0.13	59	0.70	17	0.20
What do you use to store your information?		Hard Drive		Zip drive		USB Flash drive		Diskette		CD/DVD		Other	
	84	74	0.88	3	0.04	72	0.86	6	0.07	39	0.46	3	0.04
Your e-mail account is:		Personal		Shared									
	84	74	0.88	10	0.12								

time in another country participating in an international academic exchange, consistent with the existence of international projects in their institutions (n=83, 99%). In addition, it was reinforced by all of them that multicultural settings were considered a great educational opportunity.

Computer and Internet possession and availability at home were good measurements for researchers' perception of the use and need of technology, which is basic for distance education.

As shown in Table 21, the perspective of technology in the researchers' institution was measured through five items of the instrument. Fifty two percent (n=52) considered their institution to be equipped and very much equipped in computer technology, 32% (n=28) to be somewhat equipped with the minimum necessary, while only 8% (n=7) declared that their institutions were not at all equipped. Interviews exposed that researchers perceived computer technology equipment as a measurement of the quality of their institution. One researcher quoted "tell me what type of computer you have and I'll tell you how advanced you are" [21RLK]. Another commented that state of the art computer technologies meant serious scientific research. This depicted that the perspective of technology was of high value among researchers.

Storing information devices was also a good measurement of how technology was perceived as reliable. E-mail was perceived as a personal technology medium of communication and information exchange by 88% of the participants.

Identification

Identification measures when an individual identifies with their culture and feels part of the group, internalizes its goals, interests, aspirations, values and standards. This area was assessed through eight items of the instrument as shown on Table 22.

Analysis showed that most of the researchers' identify with their institutions. As for identifying with distance education nearly half of the researchers had access to Web platforms to develop courses delivered at a distance. The majority of the participants claimed not to know about specifics of distance learning processes in their institutions.

Table 22

Items of the Identification Area

Statement	**N**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**
International projects in my institution are…		Part		Rare		Do not exist			
	84	72	0.86	11	0.13	1	0.01		
If you are involved in an international project that requires a internship in another country you would:		Move with your family		Move by yourself		Pass the opportunity to a colleague		Expect your institution to send another person	
	84	41	0.49	22	0.26	1	0.01	20	0.24
For decisions regarding international projects…		Contact the power structure		Make decisions through my immediate supervisor		Make the decisions and inform authorities later			
	84	1	0.01	26	0.31	13	0.15		
		Make decisions with my authorities		I do not make decisions					
		22	0.26	22	0.26				
Distance Education	**N**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**
Does your department have access to a Learning Management System?		Yes		No		Do not know			
	84	34	0.40	28	0.34	22	0.26		
Do you have to go through a complicated system of authorization and Web experts to develop a course and uploaded on the Web?		Don’t know		Yes		No			
	84	55	0.65	8	0.11	21	0.25		
What kind of Internet access connection do you have?		Dial-Up		Cable		DSL		Satellite	
		6	0.08	20	0.26	24	0.31	3	0.04
	77	Other		Don't have					
		18	0.23	6	0.08				
Your Internet access connection is…		Fast		Acceptable		Slow			
	71	38	0.54	19	0.27	14	0.20		
You have this kind of Internet connection at home because…		Availability		Cost		Convenience		Speed	
	71	19	0.27	6	0.08	38	0.54	17	0.24

Seventy two researchers (86%) declared that international projects were part of their institutions. From those, 41 (49%) participants would move to another country if necessary, 20 (26%) would move by themselves, and 20 (24%) would expect their institution to send a person according to the authorities' interests. This last group of participants did not feel they belonged to their institution group. In the interviews some researchers said that they would expect this due to political issues or authority personal interest. When asked about decisions regarding projects, 26% (n=22) said they did not make decisions and one declared to contact the power structure. Making decisions through authorities or with supervisors was answered by 57% (n=48), which indicated they were considered part of the institution. Thirteen researchers affirmed to make decisions and inform authorities later. In the interviews some participants from this group said that they were either part of the authority structure or the environment of their work allowed them to make decisions because they shared interests, goals and values.

As for identifying with distance education, 34 (40%) researchers said their department had access to a Learning Management System, 28 (34%) did not have access and 22 (26%) did not know, which meant they had not required this system. Twenty one participants (25%) did not have to go through a complicated authority system to develop and upload a Web page, eight (11%) respondents had a complex route and 55 (65%) did not know.

The kind of Internet access in relation with the speed and the reason for the type of connection in their home described how they identified not only with technology, but with distance education.

Power Distance

Even though inequality exists in every culture, the degree to which it is accepted varies from culture to culture. Table 23 describes the items used to assess this cultural dimension. It was comprised of six questions which were measured through the scale of high power distance and low power distance. High power distance cultures accept unequal distribution of power within its society, and low power distance cultures strive for equalization and participation (Hunter & Beck, 1996).

Latin American countries, as the result of this assessment, were considered high power distance. The U.S. was considered to have low power distance (Simon, 2001; Zey-Ferrel, Weaver & Ferrel, 1979; Zey-Ferrel & Ferrel, 1982; Hofstede, 1991).

Regarding decisions on international projects it was found that high power distance was representative with 58% (n=49) not making decisions. Contacting the power structure and supervisor were considered high power distance. The communication structure in the institutions was predominantly high in power structure (61%), where face to face was rated mildly high power, written documents and sealed of received written documents were rated extremely high power.

Researchers asked about their opinion about the duration of internships in another country resulted in high power distance, with the majority considering weeks (48%) and less than three months (41%) as the appropriate duration. Responses in the interviews reinforced the analysis and results of this item. In the interviews participants noted that they could not neglect their jobs for too much time, even if it was for job related issues. One commented “if I go for too long they will forget about me” [CRSG].

Table 23

Items of the Power Distance Area

Statement														
For decisions regarding international projects…		Contact power structure		Through immediate supervisor		Make decisions inform later		Make decisions w/authorities		Do not make decisions		Total (%)	
Degree H=High L=Low		**H**		**H**		**L**		**L**		**H**		**H**	L
	N	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	**%**	
	84	1	0.01	26	0.31	13	0.15	22	0.26	22	0.26	0.58	0.42
At work, you communicate with co-workers, authorities, providers, etc…				E-mail		Face to face		Written documents		Written documents sealed		Total (%)	
Degree H=High L=Low				**L**		**H**		**H**		**H**		**H**	L
	N	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	**%**	
	157	62	0.39	63	0.40	17	0.11	15	0.10			0.61	0.39
For an academic exchange that requires an internship in another country, what is the time period considered appropriate				Weeks		Months		Years		Other		Summary (%)	
Degree H=High L=Low				**H**		**H**		**L**		**H**		**H**	L
	N	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**			**%**	
	98	47	0.48	40	0.41	10	0.10	1	0.01			0.90	0.10
Do you have to go through a complicated system of authorization and Web experts to develop a course and upload on the Web?						Don't know		Yes		No		Total (%)	
Degree H=High L=Low						**H**		**H**		**L**		**H**	L
	N	***f***	**%**	***f***	**%**	***f***	**%**					**%**	
	84	34	0.40	28	0.34	22	0.26					0.75	0.26
Does your department have access to the equipment?						Yes		No		I don't know		Total (%)	
Degree H=High L=Low						**L**		**H**		**H**		H	**L**
	N	***f***	**%**	***f***	**%**	***f***	**%**					**%**	
	84	83	0.99	1	0.01	0	0.00					0.01	0.99
How comfortable are you doing important matters through e-mail and Internet?						All matters		Every day issues		Never		Total (%)	
Degree H=High L=Low						**L**		**H**		**H**		H	**L**
	N	***f***	**%**	***f***	**%**	***f***	**%**					**%**	
	84	47	0.56	37	0.44	0	0.00					0.44	0.56

The question about going through a complicated system of authorization to develop and upload on the Web was found to be prevalent with high power distance (34%). The participants that did not know (40%) could not be measured because they had not required this service.

There was a low power distance when it came to access to computer technology equipment (99%, n=83). Interviewers said authorities were interested in research results and that depends on the use of technologies. They also added that depending on the interest of research production of their institution, computer technologies were distributed. One participant stated that “my department is not a high priority of the institution, so we had the minimum necessary. But there are other departments that have state of the art technologies; although if we need something we can access them, of course with a lot of time lost in the process” [H15JC].

Another item to assess power distance was doing things through Internet and e-mail. This item was measured as low power distance with 56% considering doing all their communication through this media.

Uncertainty Avoidance

Uncertainty about the future refers to people trying to cope through the domains of technology, law and religion. In organizations, the domains were technology, rules and rituals. The indicators of these domains were orientation, employment stability and stress measured as strong or weak. Strong uncertainty avoidance cultures attempt to control uncertainty by strict rules and codes of behavior, while weak uncertainty

avoidance cultures are not as strictly controlled and deviation is more acceptable (Hunter & Beck, 1996). Table 24 shows the item assessed for this cultural dimension.

From the six items, four scored strong uncertainty avoidance, which exposes how uncertainty was perceived in Latin American cultures.

Strong uncertainty avoidance was observed when assessing rules for decision making. Fifty eight percent of the researchers expressed having to either contact the power structure, go through a supervisor, or not being able to make decisions. When asked about a complicated structure to develop and upload Web pages, a strong uncertainty was obtained.

A weak uncertainty was observed on job stability, with 85% (n=71) describing their employment as a full time career.

Participation on international internships was measured as weak, with 96% (n=81) feeling able to participate, although strong uncertainty resulted when asked how they would move in these circumstances. Forty nine percent (n=41) would move with their family and 24% (n=20) would expect their institution to send another person appropriate to their political interests. In the interviews, respondents said they were more family oriented. One commented “My family goes where I go, and decisions are taken based on family needs, expectations and realities” [1RMM].

The interviewers that expected their institution to send someone else commented that their institutions were oriented to their selfish interests. One participant wrote “I would never expect them to send me, even if I am the person indicated for the internship. I would have to be a participant of their political group, which I am not, and they would

Table 24

Items of the Uncertainty Avoidance Area

Statement													
For decisions regarding international projects…		Contact power structure		Through immediate supervisor		Make decisions inform later		Make decisions w/authorities		Do not make decisions		Total (%)	
Degree S=Strong W=Weak		**S**		**S**		**W**		**W**		**S**		**S**	W
	N	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	**%**	
	84	1	0.01	26	0.31	13	0.15	22	0.26	22	0.26	0.58	0.42
Do you have to go through a complicated system of authorization and Web experts to develop a course and uploaded on the Web?						Don't know		Yes		No		Total (%)	
Degree H=High L=Low						**-**		**S**		**W**		**S**	W
		N	***f***	**%**		***f***	**%**	***f***	**%**	***f***	**%**	**%**	
		84	34	0.40		28	0.34	22	0.26			0.34	0.26
How would you describe your work?					Full time career			Combined occupation				Total (%)	
Degree S=Strong W=Weak					**W**			**S**				S	**W**
	N		***f***		**%**			***f***		**%**		**%**	
	84		71		0.85			13		0.15		0.15	0.85
I would be able to participate in an international academic exchange, where I get to spend time in another country.			Strongly Disagree		Disagree			Agree		Strongly Agree		Total (%)	
Degree S=Strong W=Weak		**S**		**S**		**W**		**W**				S	**W**
	N	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**			**%**	
	84	1	0.01	2	0.02	42	0.50	39	0.46			0.04	0.96
If you need help performing a task on a computer you will:						Use tutorials		Ask for help		Give up		Total (%)	
Degree S=Strong W=Weak						**W**		**S**		**S**		**S**	W
		N	***f***	**%**		***f***	**%**	***f***	**%**	***f***	**%**	**%**	
		93	45	0.48		48	0.52	0	0.00			0.52	0.48
If you are involved in an international project that requires a internship in another country you would:			Move with your family		Move by yourself			Pass the opportunity to a colleague		Expect institution to send others		Total (%)	
Degree S=Strong W=Weak		**S**		**W**		**S**		**S**				**S**	W
	N	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**			**%**	
	84	41	0.49	22	0.26	1	0.01	20	0.24			0.74	0.26

send someone even if he/she is not fit for the job, as long as they have some kind of relationship, family or political connections" [CRLP].

Asking for help on computer tasks was measured with strong uncertainty avoidance with a majority (52%, n=48) preferring to ask someone for help rather than using tutorials.

Individualism/Collectivism

Hofstede (1984) defined individualism/collectivism as "the relationship between the individual and the people, which prevails in a given society. It is reflected in the way people live together" (p. 148). This dimension was assessed through six items. Individualistic cultures expect their members to be independent and look after themselves. Collectivistic cultures have a tightly knit framework of mutual dependencies and obligations (Hunter & Becker, 1996). Table 25 shows the items used in this area of the assessment.

Sharing classroom with people with other cultures was scored as a wonderful opportunity by 95% (n=80) of the participants (which was considered a collectivism dimension because a dependency among classmates was expected and sharing would take place). Interviewees said that in situations like this a bond is created by the participants and people feel like in family. A researcher said "when I have participated in multicultural classrooms, I always take my classmates home. I like to treat them as part of the family, and it has created very significant bonds" [B151Z]. This item was related to the question about cultural differences representing a barrier for scientific research

Table 25

Items of the Individualism/Collectivism Area

Statement											
Having classmates from all over the country and around the world is a wonderful educational opportunity in itself.		**Strongly Disagree**		**Disagree**		**Agree**		**Strongly Agree**		Total (%)	
Degree I=Individualism C=Collectivism		**I**		**I**		**C**		**C**		I	**C**
	N	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	**%**	
	84	0	0.00	4	0.05	33	0.39	47	0.56	0.05	0.95
If you are involved in an international project that requires a internship in another country you would:		Move with your family		Move by yourself		Pass the opportunity to a colleague		Expect other person to be sent		Total (%)	
Degree I=Individualism C=Collectivism		**C**		**I**		**C**		**-**		I	**C**
	N	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	**%**	
	64	41	0.49	22	0.26	1	0.01	20	0.24	0.26	0.50
I would be able to participate in an international academic exchange, where I get to spend time in another country.		Strongly Disagree		Disagree		Agree		Strongly Agree		Total (%)	
Degree I=Individualism C=Collectivism		**C**		**C**		**I**		**I**		**I**	C
	N	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	**%**	
	84	1	0.01	2	0.02	42	0.50	39	0.46	0.96	0.04
For an academic exchange that requires an internship in another country, what is the time period considered appropriate?		Weeks		Months		Years		Other		Total (%)	
Degree I=Individualism C=Collectivism		**C**		**C**		**I**		**I**		I	**C**
	N	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	**%**	
	98	47	0.48	40	0.41	10	0.10	1	0.01	0.11	0.89
If you need help performing a task on a computer you will:				Use Tutorials		Ask for Help		Give Hp		Total (%)	
Degree I=Individualism C=Collectivism				**I**		**C**		**I**		I	**C**
		N	***f***	**%**	***f***	**%**	***f***	**%**		**%**	
		93	45	0.48	48	0.52	0	0.00		0.48	0.52
I think cultural differences among different countries can be a barrier for scientific information exchange.		Strongly Disagree		Disagree		Agree		Strongly Agree		Total (%)	
Degree I=Individualism C=Collectivism		**C**		**C**		**I**		**I**		I	**C**
	N	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	**%**	
	84	31	0.37	32	0.38	16	0.19	5	0.06	0.25	0.75

exchange (seventy five percent disagreed or strongly disagreed, which showed a collectivist feature).

Forty nine percent (n=41) of the participants declared they would move with their families if they needed to go to another country in an internship, plus the one researcher that would have passed the opportunity to a colleague (for family reasons, as he declared in an interview). Expecting the institution to send another person (24%, N= 20) was not in the perspective of this measurement, because it does not denote features of collectivism or individualism.

Being able to participate in an academic exchange and spending time in another country was considered an individualistic response. But when asked what period of time would be considered appropriate for this international exchange, 89% (n=87) answered weeks or months, a collectivism response, because, as reactions in the interviews indicated, they were more family oriented. A participant stated “Latin Americans do not leave their families and go, even if it is job related. Less than a month is painful enough to be away from my family and way of life” [5CRM].

For the question about the need for help for a computer task, collectivism again took place. The survey showed that more than half of respondents would rather ask someone for help than use tutorials. This was confirmed by interviews where participants declared they needed human contact, especially familiar contact. One wrote “what would the computer savvy do if we did not turn to her every time we needed help? Where would those meals we shared be? I need to speak to people directly and share not only work but every day life” [G21CC].

Masculinity/Femininity

The masculinity-femininity dimension is grounded in the ways sex roles were allocated in the culture. Hofstede (1984) contended that "Masculine cultures use the biological existence of two sexes to define very different social roles for men and women" (p. 390). Men were expected to be assertive, ambitious and competitive, while women were expected to serve and care for the spiritual quality of life and family. Feminine cultures, Hofstede affirms "have overlapping social roles for the sexes, in which neither men nor women need to be ambitious or competitive" (p. 390).

In the interviews, researchers were asked what percentage of women worked in their institution and the majority said less than 40%. One participant commented that when she chose her career, she had to struggle between what she liked and what her role as a family member, mother and wife would be. She quoted "women have to deal with their future as spindles of the families and their professional development" [MXB1]. Another researcher said "some of my co-workers struggle with the fact that I am the computer savvy one in the lab" [N9N15].

Most of the male interviewees (75%) when asked about how they saw women in a professional role said that there was no distinction. Women were as skilled as men, but they added that family should come first. One researcher said "family is the base of any society, especially ours [Latin American], and women are in the center" [P1TT].

With the exception of researchers from Chile, all others said, when asked if they thought their culture was male chauvinist (machista in Spanish), they agreed. Sex roles

were very specific with one participant adding that “men bring the money, although these days also women, but they are in charge of nurturing the family” [P25FD].

CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

The previous chapters include the introduction, statement of the problem, purpose of the study, significance of the study, literature review, methodology and procedures, and analysis of the data by items and sections of the data collection instrument. This chapter presents a brief summary of findings and conclusions drawn from the results for each research question with implications and recommendations.

Summary

The purpose of this study was to develop an instrument for assessing distance learning readiness of institutions in Latin America for international projects of food and agriculture with higher education institutions in the U.S.

Two culture theories were used to develop and analyze the instrument. Banks (2001) identified six major cultural elements: (a) values and behavior styles; (b) language and dialects; (c) nonverbal communication; (d) cultural cognitiveness; (e) perspectives, world views and frames of reference; and (f) identification. Hofstede (1984) recognized four dimensions of national culture: (a) power distance; (b) uncertainty avoidance; (c) individualism/collectivism; and (d) masculinity/femininity.

A directory of Latin American animal biotechnology Spanish-speaking researchers was created for the population of the study (N=150) following the Tailored

Design Method (Dillman, 2000) with a needs assessment analysis (Rosset, 1995) through a strategic planning process.

A stratified random sample was 56% of the population (n=84). A first e-mail had a response rate of 26.5%, a second e-mail had 36%, and a third 32%. Five participants were considered non-respondents. Total responses represented 95% of the sample.

For the qualitative approach, e-mail semi-structured interviews were conducted with 20 researchers.

Interviews focused on the four research questions. Both quantitative and qualitative approaches were used for analyzing the data.

Research Question One

What contextual factors should be considered when assessing distance learning readiness of Latin American institutions?

Every human activity is tainted by culture and education is not an exception. On the contrary, some researchers conclude that education is the consequence of culture. Thus, this study was based on two culture theories (Banks, 2001; Hofstede, 1984) that provided a series of contextual factors to discover distinctive cultural aspects.

Summary of Findings

The first research question determined the contextual factors that should be considered when assessing distance learning readiness of Latin American institutions

using Bank's (2001) cultural elements. Values, languages, nonverbal communications, cultural cognitiveness, perspectives, and identification were the elements used in the measurements.

Values

Values were assessed with several items aimed towards measuring the technology use among researchers. All pointed out that computers were essential tools for research development and a reliable medium to process research data. Eighty eight percent (n=74) participants responded to have a personal e-mail account, and 10 shared an account at work or home. E-mail was considered a "personal" medium of communication.

Seventy two (86%) researchers browsed the Internet several times a day with 45 (54%) using it for all their communication matters and the remaining (n=39, 46%) for every day issues. Eighty six percent (n=72) communicated with co-workers, authorities, etc. through e-mail as well as face to face or by phone. Interpersonal relations were based on direct communication and were basic for their way of lives.

Eighty two percent (n=69) responded to have a technical support department at work, indicating that tech support is valued as an important resource that is important for the institution. Sixty nine (79%) affirmed to have Internet support at work

There was a tendency to view distance learning and face to face learning differently. To perform a task on the computer, 57% (n=47) used tutorials and 54% (n=45) asked for help.

When assessing the values of the researchers about cultural differences, results of the analysis indicated that only four percentage (n=3) did not know how to interact with other cultures.

Language

The language element strived to measure English proficiency, assessed by four skills: reading comprehension, writing, speaking, and listening. Seventy one percent (n=84) declared to be able to read English fluently, consistent with 78% (n=65) that stated they did not need to translate English writing. All stated they read articles in English and were comfortable surfing the Web in English. Sixty seven percent (n=56) of the participants affirmed they wrote articles in English.

Ninety nine percent (n=83) responded to be able to communicate in English when they travel, although only 55% (n=46) could communicate their work in English. Almost the same number of researchers stated they could speak technical English (56%, n=47). Eighty six percent (n=72) of the researchers claimed to understand English in a conference. English was seen as an important tool to develop and conduct research.

Nonverbal Communication

Nonverbal communication results showed that 95% percent (n=79) of the respondents felt comfortable communicating in writing. However, when technology was involved, only 26% (n=21) had created a Web page. People learn nonverbal communication techniques over years largely by observing others and imitating them,

which is by living among people with the same culture. All those interviewed agreed that the Latin way to express in a nonverbal way was very different from the Americans.

Cultural Cognitiveness

Cultural cognitiveness results showed that all the respondents agreed that sharing a classroom with people from other countries was a great educational opportunity. In the interviews, researchers said people became aware of their culture when they coexisted with other cultures and that learning went beyond subject matter in a classroom.

Sixty three percent (n= 50) of respondents felt language delayed scientific exchange. Nevertheless, when asked about cultural differences being a barrier for scientific information exchange, 75% (n=63) of participants disagreed. Cultural differences could be overcome and English had to be mastered to enhance scientific research.

The concepts of adult education exposed characteristics of adult learners and people familiar with this theory became aware of the cultural factors that were involved. Thus, it was an appropriate measurement for cultural cognitiveness. Eighty three percent (n=70) of the participants were familiar with this theory.

Perspectives

Through perspectives, people within the same ethnic group (culture) often view reality in a similar fashion, as epistemological communities. All of the respondents agreed that sharing their work, life, and educational experience would increase the

learning process. When the English language factor was considered, 63% (n=50) of the participants agreed it could represent a barrier for information exchange.

As for distance education, 53% (n=45) perceived distance education differently from traditional education, although only 38% (n=32) had participated in courses delivered at a distance. From these, none of them rated their experience as poor. Also, 53 participants (62%) viewed obtaining academic degrees in these two ways of delivery differently, even though the majority was conscious that education was following a technology path.

Computer and Internet possession and availability at home were good measurements for researchers' perception of the use and need of technology. Ninety two percent (n=77) declared to have personal computers, 78% (n=65) of those had an updated operating systems (Windows XP) installed, and 71% (n=59) possessed Internet access connections considered by 54% (n=45) as fast, 27% (n=22) as acceptable, and 20% (n=16) as slow.

Data storage devices were also a good measurement of how technology was perceived as reliable. Eighty eight percent (n=73) responded that they store their information on the hard drive and also in another form (86%, n=72) stored it in USB flash drives, 46% (n=38) used CD/DVD and 14% (n=3) used other media such as zip drives and diskettes).

Identification

Identification measured when an individual identified with their culture and felt part of the group, internalized its goals, interests, aspirations, values and standards. The questions in this area were aimed towards the identification of the researchers with international projects, distance education, and computer technology.

Eighty six percent (n=72) of the participants declared that international projects were part of their institutions. Of these, 49% (n=41) would move to another country if necessary, 26% (n=21) would move by themselves, and 24% (n=20) would expect their institution to send a person appropriate to the institution's interests. This last group of people did not feel they belonged to their institution's group.

When asked about decisions regarding projects, 26% (n=22) said they did not make decisions and one (1%) declared to contact the power structure. Making decisions through authorities or with supervisors was answered by 57% (n=48). Fifteen percent of researchers (n=13) affirmed to make decisions and inform authorities later. In the interviews some participants from the latter said that they were either part of the authority structure or the work environment allowed them to make decisions because they shared interests, goals, and values.

As for identifying with distance education, 40% (n=33) of the researchers said their department had access to a Learning Management System, 34% (n=28) did not have access and 26% (n=22) did not know. Twenty five percent (n=21) did not have to go through a complicated authority system to develop and upload a Web page.

The kind of Internet access in relation to how they consider the speed and the reason for the type of connection in their home, described how they identify not only with technology but also with distance education. Cable (26%, n=20), DSL (31%, n=24) and satellite (4%,n=3) users considered their connection fast or acceptable and their type of connection was based on speed (24%, n=17) or convenience (54%, n=38), while dial-up users (8%, n=6) and other types of connections (23%, n=18) were due to cost (8%, n=6) or availability (27%, n=19), with slow or acceptable speed.

Conclusions

Bank's cultural elements where shown to be appropriate factors to assess distance learning readiness, because it not only proved to be flexible enough to measure the areas of interest, but also to distinguish the cultural elements embedded in it. Semi-structured interviews complemented and clarified many responses.

Advocates for distance education claimed that distance learning makes learning and training more accessible, more convenient, effective, and cost-efficient for the learners and for the educational provider. Distance learning could be used for formal education, continuing education, advanced professional education, and management/employee development. Latin America has intensified its participation in the digital world, taking advantage of the benefits it provides, but the results of this study showed that it is valued differently based upon culture. Distance education was viewed as different from face to face (traditional education) in the development and attainment of a degree. A study developed by the World Bank (2000) confirmed that

"The presence of distance learning and e-learning in Latin America has been gradually increasing in various countries. However, while there is recognition of its potential, there is not a viable solution for higher education at large" (p. 23).

It could be concluded that English is considered a basic tool for scientific research. One interviewee wrote "I am used to English terminology in my research area, because almost all the bibliography and recent research studies are in English" [1R15R]. Gee (1999) affirmed that "The primary function of human language would be to scaffold human affiliation within cultures and social groups and institutions" (p. 1).

Drawing on Halliday's (1978) assertion that language has a representational or "ideational" function, and that language represents a speaker's/writer's experiences, perceptions, and perspectives of the real world and the speaker's "internal" world, it follows that any changes or developments in the way the language user perceives the world will influence his/her written and spoken language.

It could also be concluded that technical English proficiency among the researchers was considered an essential tool for research and work development. Ammon (2001) declared that "English is today's dominant language of science" (p. 1).

Interviews exposed that researchers were aware of nonverbal communication differences between Latinos and Americans. As stated by various authors (Hall & Hall, 1990; Zarir, Dobing & Hunter, 2002) Latin American Web sites are significantly different from the U.S. Web sites. Cultural elements are embedded in the pages and Web pages express the way people view the world through their culture.

Cultural cognitiveness was shown to be exposed when researchers were confronted with another culture, creating awareness of cultural differences. In addition, adult education theories help to increase awareness because it describes adult characteristics which exhibit cultural differences.

Through perspectives, people within the same culture often view reality in a similar fashion. The perspective of distance education was shown to be considered different from face to face education. Although researchers claim to be aware that education is transforming towards technology they perceived the two ways of education delivery (at a distance and face to face) differently, giving a higher academic score to traditional education. This also exposed a difference between awareness and perception, where awareness meant to be informed and perception the way things were viewed through the cultural veil.

It was also concluded that there was an appropriate perception of the need, ownership, and use of computer technologies and Internet accessibility with fast connections. Researchers perceived computer technology equipment as a measurement of the quality of their institution.

Implications

Conclusions drawn from this research question showed that Bank's (2001) elements or contextual factors must be taken into consideration when assessing distance learning readiness of Latin American researchers to ensure the successful development, outcomes, and continuity of a distance learning project. Blight, Davis and Olsen (1999)

reinforced this stating that globalization of higher education has been ignoring cultural identities, and it has increased with the use of distance education. In addition, if it is considered that new views of education describe learning as the appropriation of cultural practices and the development of an identity within those practices (Holland, Lachicotte, Skinner, & Cain, 1998; Lave & Wenger, 1991; Wenger, 1998), it is far more important to embrace cultural theories, such as Banks, to exhibit differences among project participants and education providers in the projects.

The use of this instrument requires to be analyzed based on Banks' (2001) culture elements to expose differences in contextual factors, which will determine the path to follow, not only in the distance learning program of a project, but also in communication structures among project members. Also, it implies direct communication with participants (via e-mail) to complement results of the instruments, to clarify concepts or tendencies, and to create bonds that will strengthen relations among project members.

Recommendations

The development of the instrument was based on two culture theories, and for it to achieve the goal of providing accurate data and essential information to develop an appropriate distance education program, it is necessary to use those culture theories to analyze the data.

Some items in the instrument were used several times in different areas of the analysis, thus, it is important to note that they were related with different items to assess different features. For example, the item of the instrument that asked about

communicating in writing was used in the assessment of distance education interests, because the most prevalent ways of distance delivery uses communication in writing. It was also used in the assessment of values to determine how distance learning was *valued* among participants. It was part of the English proficiency section and also in the power distance area assessment, where it denoted the way of communication within an organization.

It is recommended that the people who will analyze results of the instrument is knowledgeable about the cultures involved, the American culture and more over the culture from the participant researchers, because the detection of values, symbols, communications, etc., will be more easily understood and accurately interpreted.

It is also recommended to implement the qualitative approach from the beginning of the project, meaning that communication with potential participants must be established in an individual manner and in a timely fashion. Better results are achieved if replies to participants are made in the same day.

In addition, it is important to consider the different working calendars of the countries involved in a project, to make sure communication is being sent when people is at work.

Research Question Two

Is there a difference when assessing distance learning readiness between American and Latin American researchers?

Hofstede's (1984) cultural dimensions were used to answer this question. The analysis was divided into four areas: (1) power distance, (2) uncertainty avoidance, (3) individualism/collectivism, and (4) masculinity/femininity.

Summary of Findings

The second research question aimed to determine differences when assessing distance learning readiness between U.S. and Latin American researchers.

Power Distance

Latin American countries were considered to have high power distance on four of the six items assessed by this measurement. Decision making was one of the items assessed. Not being part of the decision process, or doing it through the power structure or a supervisor, was scored as high distance (58%, n=49).

Communication structure was also scored high; with face to face (40%, n=63) considered mildly high, written documents (11%, n=17) as high, and sealed documents (10%, n=15) considered extremely high.

International internship participation was scored high and interviews confirmed this result. Researchers stated they could not neglect their jobs (their presence in their institutions) for too long (two weeks to three months) because they could endanger their positions.

Authority control over computer technology equipment scored low distance power and it was stated through interviews that authorities were aware of the importance of technology access to obtain successful scientific results.

Uncertainty Avoidance

From the six items assessed for the uncertainty avoidance dimension, four scored strong uncertainty avoidance for Latin American cultures.

Decision making was assessed in this dimension and scored strong uncertainty. A weak uncertainty was observed on job stability, where 85% (n=71) described their employment as a full time career. Willingness to participate on international projects scored weak (96% of participants, n=81 felt able to take part).

Forty nine percent of respondents declared they would move with their families if participating in an international internship. This was scored as strong uncertainty because it would produce so much stress that they would be willing to resign from the project if the family could not accompany them. In addition 24%, n=20 of the researchers would expect their institution to send someone else.

Another item that scored strong uncertainty avoidance was asking for help on computer tasks, where 52% (n=48) would ask someone to help them. Interviews exposed how mastering these tasks created so much stress that participants preferred to outsource the task to someone else.

Collectivism/Individualism

Collectivism was the result of this assessment with five out of six items. Theoretical triangulation revealed that Latin American countries had a collectivist dimension and the U.S. had an individualistic society (Hui & Triandis, 1986; Hofstede, 1983, 1984, 1991; Zarir, Dobing & Hunter, 2002; Vitell, Nwaechukwu & Barnes, 1993; Hunter & Beck, 1996; Steinwachs, 1999; Simon, 2001) matching the results of this study.

The item about sharing classrooms with people from another culture scored as a collectivist society (95%, n= 80 agreed it would be a wonderful opportunity). A dependency among classmates is expected, with intellectual sharing creating strong bonds. Another collectivist feature resulted when asked about cultural differences representing a barrier to cultural exchange (75%, n=63 disagreed).

The willingness to move to another country for an international project was scored as individualistic (96%, n=81). However, moving with their families for an international internship scored as collectivism (50%, n=42). Considerations about the period of time appropriate for them to be on an international exchange scored as collectivism and interviews showed that decisions were based upon family commitments. Asking for help on computer tasks scored as collectivism, with interviews supporting that interpersonal relations were important and personal dependencies were created.

Masculinity/Femininity

The masculinity-femininity dimension was grounded in the ways sex roles were allocated in the culture. This area was assessed through semi structured e-mail interviews and validated with several studies (Hofstede, 1984, 1991; Simon, 2001; Zarir, Dobing & Hunter, 2002; Vitell, Nwaechukwu & Barnes, 1993; Hunter & Beck, 1996; Steinwachs, 1999). The analysis revealed that Latin American cultures were predominantly masculine.

Conclusions

It was concluded that Hofstede's (1984) cultural dimension provided an appropriate framework to answer this research question.

Power Distance

Latin American countries were considered to have high power distance on four of the six items assessed by this measurement. The U.S. was considered to have low power distance (Simon, 2001; Zey-Ferrel, Weaver & Ferrel, 1979; Zey-Ferrel & Ferrel, 1982; Hofstede, 1991). The analysis of this dimension was confirmed by Simon (2001) who stated that:

> Individuals who come from cultures exhibiting high power distances…[such as some countries in Latin America]…might be expected to respond in socially desirable ways designed to please those in higher positions of power, stressing coercive, established, and referent power. On the other hand, those who come

> from cultures with low power distances…[such as] the U.S. (Hofstede, 1991) - may feel more free to express their own opinions while stressing expert and legitimate power, participative management, and equal rights. (p. 22)

Results of this study showed how participants had to go through complicated authorization structures to achieve something that was part of their work, and interviews exposed that it was part of the authorities' control over subordinates.

Analysis of these results are supported by the literature and show that cultures respond, express, communicate, participate, make decisions and have expectations that differ based upon power difference. Results from the present study showed that communication structures are well defined showing high power distance.

In addition Steinwachs (1999) declared:

> In cultures with small power distances… [Such as the U.S.], the need for information to support the decision-making process will be felt by many more people. Also, as status is not of such importance, the open search for, and use of, external information is not likely to be interpreted as a weakness – external information sources could be expected to be consulted much more widely. (p. 201)

Zey-Ferrel, Weaver and Ferrel (1979), and Zey-Ferrel and Ferrel (1982) concluded that in countries such as the United States with low power distance, individuals look more to both their peers and informal norms than to their superiors and formal norms for guidance on appropriate behavior. This did not mean that superiors do not influence ethical behavior; instead it meant that in countries with a low distance,

their influence may be lessened. However, in countries with a high power distance, such as in Latin America, superiors are expected to act autocratically without consulting subordinates, which was confirmed in the present study, where it was found that decision making was controlled by authorities, and participants accepted this as a fact .

All dimensions of culture have an influence on the producer of knowledge and on certain aspects of the knowledge itself. In cultures with high power distances, students are educated to respect their teachers as ‘gurus’ who transfer personal wisdom (Hostede, 1984).

According to Hofstede (1991) organizations in large power distance societies centralize power as much as possible in a few hands and visible signs of status contribute to the authority of bosses. In the present study it was observed that the power to make decisions was the privilege of a selected few people, and then the others are not likely to have a strong motivation or even the possibility to access information to solve problems.

Mead (1994) pointed out that “In large power distance cultures, superiors act in ways which help to emphasize their authority, while their subordinates see it as being in their interest to preserve this authority. Communication therefore tends to be one-way” (p. 179). In the interviews, participants stated that the communication with authorities was many times one way.

Uncertainty Avoidance

Uncertainty about the future is when people try to cope through the domains of technology, law, and religion. In organizations, the domains are technology, rules and

rituals. The indicators of these domains are orientation, employment stability, and stress. Hunter and Beck (1996) explained that strong uncertainty avoidance cultures attempt to control uncertainty by strict rules and codes of behavior, while weak uncertainty avoidance cultures are not as strictly controlled and deviation is more acceptable.

Analysis of this dimension showed that Latin American countries had strong uncertainty avoidance, while literature proved that the U.S. had weak uncertainty avoidance (Hofstede, 1983, 1984, 1991; Zarir, Dobing & Hunter, 2002; Vitell, Nwaechukwu & Barnes, 1993; Hunter & Beck, 1996; Steinwachs, 1999; Simon, 2001).

Vitell, Nwaechukwu and Barnes (1993) affirmed that a low ranking in the uncertainty avoidance dimension was indicative of a society that had fewer rules and did not attempt to control all outcomes and results. It also had a greater level of tolerance for a variety of ideas, thoughts, and beliefs. This was confirmed by Hosftede's research (1991) where the U.S. ranked weak uncertainty and most of the Latin American countries ranked strong uncertainty avoidance.

Steinwachs (1999) maintained that in "Cultures with strong uncertainty avoidance, needs might be less likely to perceive unexpected opportunities or to follow them up by getting into the stage of information gathering necessary for evaluation of the opportunity" (p. 201). And as showed in the present study, strong uncertainty was observed in several areas such as international internships were 20% (n=22) of the participants stated they would expect their institution to send someone else and participants accepted it as the way things were in their institutions and in their cultures.

According to Hofstede (1984), weak uncertainty avoidance cultures are more likely to stimulate basic innovations, as they maintain a greater tolerance towards deviant ideas. Innovation and the use of external information are necessarily interrelated; innovative ideas are dependent on external stimuli. In the interviews researchers stated to be aware of some differences with the American researchers, some participants declared that new things came always from the US and that adoption in their organizations always took more time.

Collectivism/Individualism

Simon (2001) describes the difference between these collectivism and individualism concepts:

> In collectivist societies… [such as most countries in Latin America] (Hofstede, 1991) individuals are presumed to look after the interest of their group before themselves. Thus, collectivists might display great loyalty to their group and be biased toward protecting the interests of its members. As a result, individuals prefer cohesive and tightly knit social frameworks, group harmony, and reduced levels of intra-group confrontation. On the other hand, a society with a propensity towards individualism… [such as] the U.S. (Hofstede, 1991) implies a loosely knit society in which people are expected to care primarily for themselves and their immediate family. Individualists can be expected to experience relatively little pressure from others tending to be universalistic and apply the same standards to all. (p.23)

Collectivism was the result of this assessment, with five items out of six validated by several studies where it was found that Latin American countries had a collectivist dimension and the U.S. had an individualistic society (Hui & Triandis, 1986; Hofstede, 1983, 1984, 1991; Zarir, Dobing & Hunter, 2002; Vitell, Nwaechukwu & Barnes, 1993; Hunter & Beck, 1996; Steinwachs, 1999; Simon, 2001). Hofstede (1984) explained that individualistic societies "assume individuals look primarily after their own interests and the interests of their immediate family (husband, wife and children)" (p. 390), while collectivistic cultures "belong to one or more 'in-groups' from which they cannot detach themselves" (p. 390). Results from the present study showed that participants felt more family oriented, and that many decision were made considering first the family needs.

Steinwachs (1999) added "More collectivist cultures tend to put great emphasis on the maintenance of harmony within the 'in-group'" (p. 109). This was confirmed by the results of the present study were people turned to colleagues for help to maintain the social relations among them.

Masculinity/Femininity

Interviews determined a masculine dimension was predominant in the study, which was validated with several studies. The U.S. fell between the two dimensions with a high inclination towards the feminine dimension (Hofstede, 1984, 1991; Simon, 2001; Zarir, Dobing & Hunter, 2002; Vitell, Nwaechukwu & Barnes, 1993; Hunter &

Beck, 1996; Steinwachs, 1999). Simon (2001) confirmed this in his statement "The U.S. falls in the middle of the masculinity-femininity scale" (p. 23).

From the interviews it could be concluded that although researchers thought women should develop professionally, their main objective should be family nurturing. It was also noted that technological skills are thought to be mastered by men. Most of the interviewees declared they considered their culture as male chauvinist.

The results on the assessment and analysis of the items for the second research question showed that Latin American countries were considered high power distance, strong uncertainty avoidance, a collectivist society and a masculine dimension. The U.S. was considered through the literature review with low power distance, weak uncertainty avoidance, an individualistic society, and in the middle of the masculine/feminine duality. These items indicated that there was a difference between these countries and when assessing distance learning readiness these differences must be taken into account to retrieve reliable information and adapt international project programs to those differences.

Implications

Development of the instrument items and its analysis based on Hofstede's (1984) cultural dimensions proved to be an appropriate approach towards determining differences between Latin American and U.S. researchers. These exposed important features and characteristics within each culture, which must be taken into consideration when developing an international distance education project.

The use of the instrument to depict differences between American researchers and researchers from other cultures requires knowledge about these cultures to be able to analyze and interpret results accurately, basing many of these interpretations and analysis from the interviews, which will determine tendencies for the researcher to inquire more profoundly.

Recommendations

During the interviews and the analysis process it was highlighted that questions about gender should be included in the instrument to allow the masculinity/femininity dimensions to be assessed through quantitative measures. It was also noted that questions about communication should be separated to identify communication with and through authorities and power structure, and among co-workers and colleagues. Thus, it is recommended that questions about gender must be included in the instrument and that the communication questions make a distinction between communication with authorities (power) and co-workers.

Interviews proved to be an important source of information, not only to clarify some concepts or ideas, but as main source of data. It is recommended to develop interviews as a crucial element of the assessment, because it will also create bonds with potential participants of a project. Building relationships is critical to the success of multi-national projects.

In addition, it is recommended that previous studies about these dimensions are considered, because these studies extent and expose other contextual factors adding

explanations that will make the researchers more knowledgeable about the cultures involved in their study.

It is also recommended that further studies with cross-tabulation of these dimensions be developed to determine if the dimensions have a correlation among them.

Research Question Three

How can political issues in Latin American institutions be assessed and measured? Political meant selfish interests of authorities to maintain and grow power within the institution.

Summary of Findings

Two dimensions from Hoftede's (1984) work helped to achieve the answers to this question: Power Distance and Uncertainty Avoidance. Although these two dimensions have been used in a previous research question, the analysis was aimed towards the political arena within the institution. For this, it is necessary to consider not only the way that power is structured in the organizations, but also how people perceive and develop within it. Cultural factors have an influence on the decision maker as a person and on the general way in which decisions are made in society.

The decision making and the structure of authority questions indicated that Latin American animal biotechnology research institutions had a very established and complicated organization of authority with the existence of invisible power structures.

A researcher in an interview said “Here, politics are more important than academics, and if someone asks, I did not say this” [21RLK]. Others commented that if they wanted to grow in their institution, they had to belong to the political (power) group within the institution.

Communication in the organizations was scored with high power distance, where 11% (n=17) used written documents and 10% (n=15) needed those documents to be sealed by the recipient stating they received the document. This indicated that people have to have a backup for any communication. In an interview a participant wrote “for any important matter on the job, I keep a copy as proof” [5LJF]. Forty percent (n=63) said they communicated also face to face implying they have to be seen when contacting authorities. Interviews provided more information about this matter. A researcher said “If they don’t see me, I do not exist” [CHC1]. Another researcher commented they had to be in constant contact with authorities to ensure their place in the organization. Societies with these dimensions are expected to respond in socially desirable ways designed to please those in higher positions of power, stressing coercive, established, and referent power (Simon, 2001).

Expecting the institution to send another person for an international project (24%, n=20) was another measure of how power works. Communication structure (with high power distance and strong uncertainty avoidance) was shown to be authority dependant in Latin American Institutions.

Conclusions

The third research question aimed to define how political issues in Latin American institutions were assessed and measured. Conclusions about this research question were drawn from the analysis of two dimensions. Power distance and uncertainty avoidance were important when assessing Latin American researchers for their participation in any type of international projects, especially at a distance. Awareness of how the structure of power works and affects the every day academic research development of the project is complicated and serious consequences could be developed as a result. Greer (2001) corroborated this conclusion in his study, stating:

> Researchers have identified some conditions in the Mexican business environment and culture, such as centralized decision-making and high power distance, that may be associated with greater tendencies for escalation of commitment (DeForest, 1994; Stephens & Greer; 1995; Trompenaars & Hampden-Turner 1998).(p.52)

It was also noted that belonging to the power group within the organizations ensured not only researcher participation in work options, such as projects and higher job positions, but also job stability. Steinwachs (1999) stated that “In cultures with large power distances, decisions are usually taken by the hierarchically superior individual, e.g. the head of the family or the superior at work” (p. 200).

Implications

Analyzing political issues implies the combination of two dimensions: power distance and uncertainty avoidance, because political or power issues within organizations are factors difficult to determine especially in countries with high power distance. Relating it to uncertainty avoidance offers information that could indicate the existence of power structures, as shown in the analysis presented in this study.

It also implies the use of interviews as the spindle of the research, because it takes the questions to the political arena, and broadens the researchers' perspectives about the political situation involved. Although, interviews have to be developed with caution, because these are sensitive matters and respondents could easily stop communicating truthfully.

Achieving to define political issues will provide crucial information for the development of an international project, such as how to approach authorities and communicate with them, the best strategy to ensure appropriate selection of participants, and strategies for the continuity of the project

Recommendations

Assessment of international projects of any kind, especially the ones that include distance education, must obsessively give special attention to this matter because political factors within organizations can define the success or failure of a project.

It is recommended that researchers developing the assessment are embedded in the culture (to be assessed) to easily detect crucial factors, and interpret and analyze them accordingly. If there is no knowledge about the culture, political factors could be detected but hardly understood, and interpretation and analysis could take a path different of the reality.

Interviews provided an important resource for obtaining data, although, political issues are very delicate matters. It is recommended that interviews be developed very carefully because people will give answers that will not jeopardize themselves, and thus may not provide accurate responses. Ensuring confidentiality is paramount, so that no harm comes from truthful responses. Politic matters must be dealt indirectly, never compromising the interviewee. It is strongly recommended that rapport with participants be established in order to obtain accurate information. In addition, sharing experiences with power and authority structures creates bonds that ease and broadens the process of questions and answers.

Research Question Four

How can distance education technology infrastructure readiness be measured accurately in Latin America?

When dealing with cultural issues it is difficult to examine a part of the whole without considering that whole, which is the cultural scenario. To answer this research question, this study focused on the technology area of the instrument. Distance learning readiness means the degree to which an individual or institution is prepared, willing and

has the capacity to participate in the digital world of education (Schlosser & Simonson, 2000). Technology has multiple uses in the context of education and learning, such as information management (IT), learning management and distance education delivery.

Summary of Findings

The technology area of the instrument from the present study was used to respond to this research question. It was divided into five groups: (1) Internet, (2) Technical resources, (3) Computer proficiency, (4) Distance education and (5) Instructional design.

Internet

Internet assessment was divided into three sections: (a) Internet availability, (b) Network and speed, and (c) Internet experience. This provided information about infrastructure in the Latin American animal biotechnology institutions comprised in the present study.

Internet Availability. The home Internet connections were used for analysis of this variable because it showed preparedness of the researchers for distance education. Seventy percent (n=59) of the researchers declared to have fast types of connections (cable, DSL, satellite and T1) chosen because of connection speed or convenience. There was a small percentage (2%, n=2) of slow connections (dial-up) or those who did not have a connection at home (8%, n=7).

It could be concluded that researchers were prepared to participate in a distance education venture.

Network and Speed. This section included questions about the type and speed of Internet connection. A correlation between the type and speed of Internet connection showed a weak negative association (r=-.439) that was a significant correlation at the 0.01 level.

Most respondents with broadband connections declared to have that type of connection because it was fast and convenient. It was interesting to note that two dial-up users considered their connection fast.

Internet experience. Conclusions drawn from a cross-tabulation analysis of Web browsing frequencies and purpose showed that researchers who frequently (several times a day) browsed the Web (86%, n=72) were mainly using it for communication (e-mail, 85%, n=73), for work (85%, n=73) and for research (56%, n=50).

Technical Resources

The area of technical resources was divided into two sections: (a) hardware and software, and (b) service and support.

Hardware and Software. All participants had access to a computer at work, where 83% (n=70) had a personal computer and the rest (17%, n=14) shared it with other researchers. All researchers used several devices to store data. The ones who shared computers did not store sensitive data on the hard drive. Ninety four (n=79) participants with personal computers used the hard drive to store all their data, but they also used

other devices to keep backups with the most popular being USB flash drives (93%, n=73) and CD/DVD (53%, n=42). This pointed out that all researchers had a common practice for data storage.

The cross-tabulation analysis of computer operating systems and processors showed that processors with Pentium 4 and higher (52%, n=43) had installed Windows XP operating systems (46%, n=39). The computers with processors below Pentium 4 (Pentium 1, 2, and 3, 15%, n=13) also had installed Windows XP (7%, n=6), and the rest (8%, n=7) did not know the type of operating system. The researchers who did not know what type of processor their computers had (26%, n=22) declared to have Windows XP (25%, n=20) or Windows 98 (n=2). Only 21% (n=18) of the participants stated to have old processors and only 12% (n=10) to have old operating systems. Thus it could be concluded that hardware is updated in the institutions of the participants.

Perception of the computer processors by participants resulted in 54% (n=45) considering their institution to be up-dated or with state of the art computer equipment. Their processors ranged from Pentium 1, 2 or 3 (5%, n=4) to Pentium 4 (17%, n=14), and later (6%, n=5). Twenty six percent (n=22) did not know the type of processor, but they considered their equipment to be updated (18%, n=15) or state of the art (8%, n=7). It was interesting to note that nine (11%, n=9) researchers with Pentium D scored their equipment as common. It could be concluded that in general researchers have a consistent perception of the state of computers processors. It could be assumed that the perception of the equipment within organizations is consistent with the perception of how up to date computers operate.

The familiarity and use of the most common programs used in distance education were assessed and it showed that word and data processors (Microsoft Word and Excel), presentation creators (Microsoft PowerPoint), and document secure sharing (Adobe Acrobat) programs were used commonly by the researchers. Web page creators (Microsoft FrontPage and Macromedia Dreamweaver), media creators (Microsoft Producer, Macromedia Authorware and Macromedia Flash) and image editors (Adobe Illustrator) were less known and used, with the exception of Adobe Photoshop (image editor) which was used by 67% (n=56).

A low percentage declared their institution to have a LMS (35%, n=29) and from those, the majority (80%, n=68) did not know which one they had. This pointed out that the majority (65%, n=55) of the institutions do not have an established system of learning management.

Service and Support. The quality and existence of technical support professionals were essential in maintaining a network and providing service. This section assessed the usefulness of service and support considered in animal biotechnology organizations in Latin America.

The results of the analysis of this section showed that 79% (n=66) had Internet service support and 86% (n=72) of those had contacted them more than once rating them from very efficient to efficient, with none considering them inefficient. Eighty two percent (n=69) of participants declared having a technical support department. The ones that did not have an established support service in their institution mainly solved their problems through a computer savvy co-worker. It could be concluded that the majority

of the research institutions comprised in the sample were aware of the importance of technical support service.

Computer Proficiency

These items assessed how comfortable researchers were using a computer. The result of the measurement showed that 95% (n=80) were comfortable using a computer, 79% (n=66) look forward to learning new software or technologies, and all of them solved their problems when dealing with computer tasks through tutorials (48%, n=40) and/or through computer savvy coworkers (52%, n=44).

Distance Education

To assess this construct distance education was divided into three sections: (a) experience, (b) skills, and (c) interests.

Experience. Experience with distance education is necessary to develop and adjust the project starting point, level and expectations.

The assessment of this section showed that 37% (n=31) of the participants had previous experience with courses delivered at a distance; 38% (n=12)of those participated as students, 31% (n=10)as facilitators or instructors, 28% (n=9)as authorities, and one as a designer. From those with pervious experience, 43% (n=15) were online, 46% (n=16) through videoconference, 9% (n=3) through videotapes and

one with CD-ROM. The online courses were delivered through diverse platforms or LMS: Whiteboard (73%, n=11), WebCT (13%, n=2) and Blackboard (n=1).

Twenty six percent (n=22) of the participants stated to have created a Web page and 49%(n=41) to have created media to be place on the Web, although interviews exposed that they were part of a work group designated to create these elements and that their participation was mainly with the content.

Skills. The analysis of this item showed that a low percentage had the skills to create Web pages and almost half of the researchers had skills in the creation of technology media.

Adult learning theory was considered an essential concept for developing distance education and more than half of the participants declared to be familiar with it. All participants subscribed to the value of introducing critical thinking into the learning process.

Interests. The results of this assessment showed that there was high interest among researchers in important features of an international distance education project such as, sharing classrooms with people from other countries and sharing life, work, and experiences in a cultural setting. These were considered by all the researchers to be a great educational experience necessary for the learning process. Distance education requires communication in writing and 95% (n=80) declared to feel comfortable communicating in writing.

Distance learning was considered by 53% (n=45) as different from face to face and interviews showed these researchers perceived that at a distance, cheating could take place.

Instructional Design

The analysis of this last section of the technology area showed that 63% (n=53) of the participants had experience in instructional design. An appropriate understanding of instruction was found within the sample group of the study and a high percentage had experience in instructional design.

Conclusions

The fourth and last research question determined how distance education technology infrastructure readiness can be measured accurately in Latin America.

Assessment was made through the technology section of the instrument which involved Internet (availability, network and speed, and experience), technological resources (hardware and software, and service and support), computer proficiency, distance education (experience, skills and interests) and instructional design experience. Results of this assessment showed that technology must be measured through a cultural perspective to achieve accurate responses because people express and understand through their mental constructs which are tainted with their cultural experiences and their perception of life, work, academics, and society.

While some educators view the use of the Internet and communication technologies as being highly contentious, there have been considerable strides made in assuring the quality of Internet information sources and education/training practices (Simon, 2001). Gomez (2004) declared that:

> The Internet is a hall of mirrors. In its multiple images, its users reflect the inequalities and injustices of the societies into which it is inserted. Thus, information technologies are not positive or negative in themselves; but neither are they neutral. They take the form and direction of the societies in which they are introduced, and at the same time they help further shape the relations and modes of interaction in these societies. Latin America is made up of a multiplicity of cultures and identities, all inscribed in societies in which access to resources, knowledge, and opportunities is inequitably distributed. Moreover, despite the institutions of formal democracy in most Latin American countries, these governments are frequently corrupt and elitist and are not subject to public accountability for their acts and omissions. (pp. 72-73)

Assessment about infrastructure of Latin American countries should be performed in an individualistic manner, targeting cultural aspects. Trigo (2000) stressed that Latin America is characterized by heterogeneity, comprising a group of nations sharing Spanish as a dominant language and an Ibero-American cultural heritage. Latin American Internet users have only 3% of domains in Spanish, with approximately 350 million native speakers of Spanish in the world (Bridges.org, 2001b). The adoption, development and use of Internet computer technologies, including the Internet, vary

substantially within the region and within each country. Different approaches are needed to comprehend the overall mapping of the region (Diocaretz, 2002).

Hilbert (2001) commented on the conditions of the information and communication technologies in Latin America. "The region will definitely go a different path than the developed world is taking, facing different obstacles and therefore calling for different solutions" (p.14).

Implications

Technological infrastructure readiness assessments of international projects that embrace distance education must contemplate the cultural aspects that are involved. An appropriate approach to achieve this situation is through the use of an instrument that inquires not only about specific infrastructure, but how culture is perceived by the members of an organization, influencing the readiness of those members.

It is a basic step in a distance education project to be able to assess technological infrastructure, because it will determine project level, stages of the distance education program, requirements, needs, opportunities, and weaknesses, among others; but it is important to do it accurately, thus, cultural elements must be taken into consideration. How participants perceive technology and its infrastructure, combined with quantitative data, such as type of computers, processors, software, Internet type, among others, will provide the necessary and accurate information to picture technological infrastructure readiness.

Some items of the instrument asked the same question in different ways, especially sensitive information for the infrastructure analysis, to ensure responses were accurate. In some cultures not knowing something is not an option; thus it is important to attain data through several items. The inclusion of an option of “other” opens the possibility for people who do not know or do not feel comfortable with an answer, allowing the instrument to cover other possibilities. The instrument used in this study allowed the respondents to choose all the answers they preferred, giving wider possibilities to obtain the most and accurate information.

Interviews confirmed to be an appropriate way to obtain data and make clear information already processed, such as answers with the choice “others” or the selection of more than one choice

Recommendations

It is recommended that cross-tabulation of the items of this section are performed, so information about what researchers have and how they perceive it is compared and conclusions drawn from this analysis. It is important to observe Internet practices among researchers, because it will denote how communication technologies are considered trustworthy and its potential among researchers.

It is also recommended that interviews following up infrastructure questions be developed, to clarify the responses (multiple responses in one question or “others” choice).

Other Recommendations and Implications

It is the researcher's belief that any project that deals with multicultural settings must include a qualitative approach. Interviews in the present study proved to be an essential resource to obtain data, to help with the interpretation and analysis of results, to clarify responses, and most importantly to create bonds that allowed the interviewer to widen the spectrum of questions and acquire broader answers.

It was also observed that because of the researcher's Latin American background and the knowledge of her culture it was easier to develop interviews in such a way that participants felt comfortable answering truthfully.

It was also observed that from the 150 researchers in the population, only 37 were women (25%). In the process of building the directory, it was noted that the majority of the women contacted (86%) replied within the same day to the next day while men varied in the time of response with no significant pattern.

The instrument developed in this study could be used in any biological, food and animal and agricultural area, to assess researchers from all over the world for distance learning readiness.

The present study focused on Latin American and Spanish speaking animal biotechnology researchers to apply the instrument, although the instrument can be used for any other country or world region. The culture theories used represent general cultural concepts, differences, or elements that are not specific to Latin America. Indeed, many studies mentioned in the present research showed the application of these two

theories all over the world. However, this study only focused on the results from Latin America and the U.S.

Results showed that cultural contexts must be considered to achieve accurate responses, not only in the development of the instrument, but especially in its analysis. Interviews as a qualitative approach increased the scope and accuracy of responses.

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APPENDIX A

INTERVIEW PROTOCOL

(ENGLISH AND SPANISH)

1. ¿Cómo percibe la educación a distancia?

   How do you perceive distance education?

2. ¿Te inscribirías a curso a distancia?

   Would you register for a course at a distance?

3. ¿Usted considera que el inglés es necesario para el trabajo?

   How do you feel about the need of English in your work?

4. ¿Crees que haya diferencias entre las páginas de Internet americanas y las Latinas?

   Do you think there is a difference between US and Latin American Web pages?

5. ¿Qué tal el shock cultural? ¿Haz tenido alguna experiencia?

   What about the cultural shock? Can you tell me about an experience?

6. ¿Crees que el tipo de equipo de cómputo tiene influencia en el avance tecnológico de tu institución?

   Do you think the kind of computer equipment has an influence in the technological advance of your institution?

7. ¿Cuanto consideras un tiempo apropiado para un intercambio académico en el extranjero y por qué?

   How long do you think is appropriate to go to an international academic exchange program and why?

8. ¿Crees que el género juega un papel determinante en tu trabajo?

   Do you think gender plays a role in the development of your job?

9. Para algunos, el machismo es parte de la cultura Latino Americana, ¿tu qué piensas?

   For some people, Male chauvinistic practices are part of the Latin American culture, what do you think?

10. ¿Qué papel crees que juega la política en el ambiente académico?

    What do you think the role of politics is in the academic environment?

APPENDIX B

LATIN AMERICAN ANIMAL BIOTECHNOLOGY

INSTITUTIONS AND RESEARCHERS

DIRECTORY

ARGENTINA (+54)

No.	INSTITUTION	WEB ADDRESS	RESEARCHER'S NAME	E-MAIL	ADDRESS	TELEPHONE	FAX
1	BIOGÉNESIS	http://www.biogenesis.com.ar/home.htm	Jorge Lamberti	jlamberti@biogenesis.com.ar	Ruta Panamericana, Km. 38.2 (B1619IEA) Garin, prov. De Bs. As. T.	+(54) (332) 744-8333	
2	BIO SIDUS	http://www.sidus.com.ar/web/gef.nsf/?Open	Dr. Genaro Montero	montero@biosidus.com.ar	Constitución 4234 (C1254ABX) Buenos Aires - Argentina.	+(54) (114) 909-8000 int. 8212	+(54) (114) 909-8055
3	Departamento de Fisiología, Biología Molecular y Celular Universidad de Buenos Aires	http://www.fbmc.fcen.uba.ar/fbmcespanol.html	Dr.Eduardo Arzt	earzt@fbmc.fcen.uba.ar	Chorroarín 280 (1427) Ciudad de Buenos Aires	+(54) (114) 4524-8400	+(54) (114) 4514-8968
4			Dr. Osvaldo D. Uchitel	odu@fbmc.fcen.uba.ar			
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7			Dr. Jorge Muschietti	prometeo@dna.uba.ar			
8	Facultad de Ciencias Veterinaria Universidad de Buenos Aires	http://www.fvet.uba.ar/	Ruben Hallu	decanato@fvet.uba.ar	Av. Chorroarín 280 - C1427CWO - Ciudad de Buenos Aires - República Argentina	+(54) (114) 524-8400	
9			Adrián Gustavo Márquez	vicedec@fvet.uba.ar			
10			Jorge Fernandez Surribas	secacad@fvet.uba.ar			
11	Instituto de Genética, CICVyA-INTA	http://www.inta.gov.ar/genetica/index.htm	Mario Poli	mpoli@cnia.inta.gov.ar	cc 25, 1712 - Castelar, Argentina	+(54) (114) 450-0805 +(54) (114) 450-1876	+(54) (114) 450-0805 +(54) (114) 450-1876
12	Laboratorio Biotecnología Animal, Departamento Producción Animal Universidad Agronomía,Universidad de Buenos Aires	http://www.agro.uba.ar/departamentos/animal.htm	Daniel Salamone	salamone@agro.uba.ar	Avenida San Martin 4453 Capital Federal (1417) Argentina	+(54) (114) 524-8000 int 8196	54-11-4524-8737
13	Instituto de Investigaciones Biotecnológicas- Instituto Tecnológico Chascomús (IIB-INTECH)	http://www.iib.unsam.edu.ar/	Rodolfo Augusto Ugalde	rugalde@iib.unsam.edu.ar	Colectora Avenida General Paz 5445 Parque Tecnológico Miguelete, INTI – Edificio 24 y 19, (1650) San Martín, Pcia. de Buenos Aires, Argentina.	+(54) (114) 580-7255 +(54) (114) 580-7256 +(54) (114) 580-7257	+(54) (114) 752-9639
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15	Instituto Nacional de Tacnología Agropecuaria Instituto de Biotecnología	http://www.inta.gov.ar/biotec/index.htm	Dr. Osvaldo Rossetti	orosset@cnia.inta.gov.ar	Rivadavia 1439 (1033) Buenos Aires, Argentina	+(54) (114) 621-0199	+(54) (114) 621-1683 Int. 108
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18	Facultad de Zootecnia de la Universidad Autónoma de Chihuahua	http://www.uach.mx/universidad/docs/fz.htm	Dr. Oscar Ruiz	oscaruiz@uach.mx	Perif. Fco. R. Almada km. 1, Chihuahua, Chih.	+(52)(614) 434-0363 +(52)(614) 434-0304 ext.15	+(52)(614) 434-0345
19	INSTITUTO POLITÉCNICO NACIONAL	www.ipn.mx/	Dr. Benjamín H. Anguas Vélez	banguas@ipn.mx	Av. IPN s/n Col. Playa Palo de Santa Rita La Paz, Baja California Sur, México. C.P. 23096	+(52) (612)-122 53 22	+(52) (612)-122 53 22
20	Universidad Autónoma de Nuevo León	http://www.fcb.uanl.mx/	Montes de Oca Luna Roberto	rmontesd@ccr.dsi.uanl.mx	Pedro de Alba y Manuel Barragán S/N	+(52) (81)-8376-4537	+(52) (81)-83764537
21	Universidad Autónoma de Nuevo León	http://www.uanl.mx/	Alberto Morales	alberto.morales@itesm.mx	Apartado Postal 128F. Cd. Universitaria San Nicolás de los Garza, Nuevo León	+(52) (81) 8376-6320 y 8367-4487 ext. 113	+(52) (81) 8376-6320 y 8367-4487 ext. 113
22	Universidad Autónoma Agraria Antonio Narro	http://www.uaaan.mx/academic/lic/licul_06.htm	Jesús Vázquez	jvarroyo1961@hotmail.com	Periférico y Carretera a Santa Fe, Apartado Postal 340, Torreón, Coah. México	+(52) (871) 729-76-10	+(52) (871) 729-76-35
23	Universidad Nacional Autónoma de México, Facultad de Medicina Veterinaria	http://www.fmvz.unam.mx/	Montserrat Arroyo	montan17@yahoo.com.mx	Circuito Exterior, Ciudad Universitaria,Delegación Coyoacán, México, D.F. C.P. 04510, Apartado Postal 70-483 y 70-486	+(52) (55) 5622-5962 +(52) (55) 5622-5963	+(52) (55) 5616-7110
24	Universidad Autónoma de Nuevo León, Instituto de Biotecnología	http://www.uanl.mx/	Dr. Luis Jesús Galán Wong	lgalan@ccr.dsi.uanl.mx	Ave. Pedro de Alba y Ave. Manuel L. Barragán s/n, Cd. Universitaria, C.P. 66451, San Nicolás de los Garza; N.L.	+(52)(81) 8376-4537	+(52)(81) 8376-4537
25	Universidad Autónoma de estado de México	www.uaemex.mx/pestud/mae_doc/ciesagr/plaestmae.html	DR. JUAN CARLOS VAZQUE	jcvc@uaemex.mx	Centro Universitario Km. 15 Carr. Toluca – Ixtlahuaca entronque al Cerrillo, Piedras Blancas. Apartado Postal 829.	+(52) (722) 296-6574	+(52) (722) 296-5518
26	Investigación Aplicada S.A. de C.V.	http://www.iasa.com.mx/	Dr. Rizo	rizoedu@aquaagro.com	7 Norte No. 416, Tehuacán, Puebla. C.P. 75700, México	+52 (238) 380-3805 +52 (238) 383 38 00	+52 (238) 380-3806

NICARAGUA (+505)

No.	INSTITUTION	WEB ADDRESS	RESEARCHER'S NAME	E-MAIL	ADDRESS	TELEPHONE	FAX
1	Universidad Americana	http://www.uam.edu.ni/index2.htm	MA. Eduardo García	eduardo.garcia@uam.edu.ni	Lomas de Monserrat, Casa B-6 Managua, Nicaragua	+(505) 278-3800 ext.311	+(505) 278-4790
2	Universidad UNAN-LEON	http://www.unanleon.edu.ni/	MSc. Rebeca Pastora	reveka@latinmail.com	Edificio Central, Contiguo a Ig. La Merced. León, Apartado Postal 68,	+(505) 311-4475 +(505) 311-4467	+(505) 311-4970
3	Universidad UNAN-Managua	http://www.unan.edu.ni	Francisco Guzmán Pasos	unanread@tmx.com.ni	Apartado Postal N. 663, Managua, Nicaragua	+(505) 278-6779	+(505) 277-4943
4			Elmer Cisneros Moreira	vrgeneral@unan.edu.ni			
5	INTA-departamento de Biotecnología	http://www.inta.gob.ni/files_html/contactos_inta.html	Dr. Aldo Rojas	arojas@inta.gob.ni	Apdo Postal: A-1247, Managua, Nicaragua	+(505) 278-8339	+(505) 278-8339

PANAMA (+507)

No.	INSTITUTION	WEB ADDRESS	RESEARCHER'S NAME	E-MAIL	ADDRESS	TELEPHONE	FAX
1	Fundación Universitaria San Martín Facultad de Ciencias Biológicas	http://www.sanmartin.edu.co/ciudaddelsaber/index.php	Dr. Julio Delgado	biotecnologia@sanmartin.edu.co	Apartado 28802 Bogotá, Colombia	+(507) 3171075	+(507)3171076
2	Universidad de Chiriqui	http://www.unachi.ac.pa/	Prof. Ivonne Oviedo	oviedo48@hotmail.com	Estafeta Universitaria, David, Chiriquí, República de Panamá	+(507) 775-7243 +(507) 775-1114	+(507) 774-2679
3	Universidad de Panamá	www.up.ac.pa/	Dr. Carlos Ramos	cramos@ancon.up.ac.pa	Apartado Postal 872117, Zona 7, Panamá	+(507) 223-9652 +(507) 223-1247	+(507) 223-6414

PARAGUAY(+595)

No.	INSTITUTION	WEB ADDRESS	RESEARCHER'S NAME	E-MAIL	ADDRESS	TELEPHONE	FAX
1	BIOGÉNESIS	http://www.biogenesis.com.py/	Rodolfo Rodríguez	rrodriguez@biogenesis.py	Gral. Díaz 471 Piso 5 casi 14 de Mayo Ed. Ahorros / Asunción / Paraguay	+(595) (2) 144-3823	

PERU (+51)

No.	INSTITUTION	WEB ADDRESS	RESEARCHER'S NAME	E-MAIL	ADDRESS	TELEPHONE	FAX
1	Instituto de Biotecnología de la Universidad Nacional Agraria La Molina (UNALM)	http://www.lamolina.edu.pe/institutos/ibt/instituto.htm	Jaime E. Lazarte, Ph.D.	jaimelazarte@ibt.lamolina.edu.pe	Av. La Universidad s/n - La Molina Estado: Lima Codigo Postal: 100 Apartado Postal: 456	+(51)((1) 435-2035 int. 234	+(51) (1) 437-1143
2			María de Lourdes Tapia y Figueroa, Ing., M.Sc.	ltapia@ibt.lamolina.edu.pe			
3			Gustavo Gutiérrez Reynoso, Ing., M.Sc.	gustavogr@ibt.lamolina.edu.pe			
4	Laboratorio de Micología y Biotecnología, Universidad Nacional Agraria La Molina	http://www.lamolina.edu.pe/simbiosis/investig/labagra.htm	Marcel Gutiérrez-Correa, Ph.D.	mgclmb@lamolina.edu.pe	Av. La Universidad s/n La Molina, Lima PERU Apartado 456, Lima 1	+(51) (1) 349-5647	+(51) (1) 3495670
5	CONCYTEC	http://www.ceprecyt.org/	Javier Verastegui	jverastegui@concytec.gob.pe	Juan Alfaro 135, San Antonio, Miraflores, Lima 18 / Perú	+(51) 447-5713	+(51) 9965-7402

URUGUAY (+598)							
No.	**INSTITUTION**	**WEB ADDRESS**	**RESEARCHER'S NAME**	**E-MAIL**	**ADDRESS**	**TELEPHONE**	**FAX**
1	Departamento de Biología Celular y Molecular Instituto de Higiene, Facultad de Ciencias Universidad de la República	http://www.higiene.edu.uy/ubp/ubp.htm	Acosta, Daniel	daacosta@mgap.gub.uy	Av. A. Navarro 3051 CP 11600 Montevideo, URUGUAY	+(598) 2480-1597	+(598) 2221078
				dacosta@higiene.edu.uy			
2			Carlos Carmona	ccarmona@higiene.edu.uy			
3			Jose Tort	jtort@fmed.edu.uy			
4			Leda Roche	lroche@fmed.edu.uy			
5			Carlos Sanguinetti	csang@fcien.edu.uy			
6	Facultad de Agronomía, Universidad de la República	http://www.fagro.edu.uy/	Agius, Fernanda	fagius@fagro.edu.uy	Avda. Garzón 7 8 0 Código Postal 12900 Montevideo - Uruguay	+(598) (2) 359-7191 +(598) (2) 359-7192 +(598) (2) 359-7193 +(598) (2) 359-7194	+(598) (2) 359-0436
7	Instituto de Higiene INIA - Uruguay	http://www.inia.org.uy/	Dra Lucy Kelly	lkelly@lb.inia.org.uy	Ruta 48 Km. 10 - Canelones, Uruguay	+ (598) (2) 367-7641	+(598) (2) 367-7609
8			Lic.Biol. Andrea Branda	andbrasi@yahoo.com.ar			
9			Téc.Lab. Emma Solares	esolares@inia.org.uy			
10			Fabián M. Capdevielle	fcapdevielle@inia.org.uy			

VENEZUELA (+58)							
No.	INSTITUTION	WEB ADDRESS	RESEARCHER'S NAM	E-MAIL	ADDRESS	TELEPHONE	FAX
1	La Universidad del Zulia	http://www.luz.edu.ve/	Albany, Nilca	nilca_albany@cantv.net	Av. 16 (Goajira) La Universidad del Zulia, Nucleo Agropecuario, Facultad de Agronomía, Dpto. Química	+(58) (416) 368-9082	+(58) (261) 749-6474/ +(58) (261) 7597107
2				jorge_nilca@hotmail.com			
3	Unidad de Biotecnología. Centro Nacional de Investigaciones Agropecuarias (CENIAP).	http://www.ceniap.gov.ve/	Morela Fuchs	mfuchs@inia.gov.ve	Avenida Casanova Godoy, Zona Universitaria, Maracay 2103. Estado Aragua, Venezuela	+(58) (243) 245-3075 +(58) (243) 245-1016 +(58) (243) 247-1874	+(58) (243) 247-4111
4			Efraín Salazar	esalazar@inia.gov.ve			
5	Instituto Venezolano de Investigaciones Científicas	http://www.ivic.ve	José Alonso Herrera	raalonso@ivic.ve	Apartado Postal 21827, Caracas 1020-A venezuela	+(58) (212) 504-1255 +(58) (212)504-1130	+(58) (212) 504-1089

APPENDIX C

SAMPLE FIRST E-MAIL CONTACT FOR POTENTIAL INSTITUTIONS WITH ANIMAL BIOTECHNOLOGY (ENGLISH AND SPANISH)

Dear (Professional title) (Name and both last names),
Hello,

My name is Patricia Villalobos; I am studying a Ph.D. in Texas A&M University, USA, in the Department of Agricultural Education and part of my studies include the creation of a Directory of Animal Biotechnology Institutions and Researchers in Latin America. All areas of animal biotechnology are of our interest. The directory will be used as the population of a research study that will be part of the researcher's dissertation to obtain a Ph.D. degree. The purpose of this study is to develop an instrument for assessing distance learning readiness of institutions in Latin America for international projects of food and agriculture with higher education institutions in the U.S., making strong emphasis in cultural contexts.

Does your institution have animal biotechnology research?
If so, whom can I contact for information and to incorporate you in the directory?
Could you help me providing information about institutions or researchers dedicated to animal biotechnology?
Sincerely
Patricia Villalobos
pvillalobos@aged.tamu.edu

Estimado (Título Profesional) (Nombre y Apellidos),
Buenos Días,
Mi nombre es Patricia Villalobos, estoy realizando estudios de doctorado en la Universidad de Texas A&M, Estados Unidos en el Departamento de Educación Agrícola y parte de mis estudios incluye la creación de un directorio de instituciones e investigadores de biotecnología animal en América Latina. Para los fines del estudio, todas las áreas de biotecnología animal son de nuestro interés. El directorio será usado como la población del estudio que es parte de la tesis de la investigadora para obtener el grado de Doctora. El estudio trata sobre cómo evaluar a los investigadores y a las instituciones de biotecnología animal en el área de educación a distancia, cuando son considerados para proyectos con instituciones de los Estados Unidos, haciendo un fuerte énfasis en los contextos culturales.
¿Su Institución incluye investigación en biotecnología animal?
De ser así, ¿con qué persona me podría dirigir para obtener información e incluirlos en el directorio?
¿Podría usted ayudarme proporcionándome información sobre instituciones y/o investigadores dedicados a la biotecnología animal?
Atentamente
Patricia Villalobos
pvillalobos@aged.tamu.edu

APPENDIX D

SAMPLE INFORMATION SHEET OF THE INSTRUMENT

(ENGLISH AND SPANISH)

Information Sheet

Development of a Culturally Appropriate Process for Assessing Distance Learning Readiness in Latin America

In any project involving distance learning, assessment of readiness of the participants (individuals and institutions) is the first step to determine the feasibility of the project. The existing needs of those participants, the beginning level of the project, and teaching and learning approaches leading to excellence in the development of the project, are some of the components. U.S. higher education institutions have been doing this quite some time for their national and international projects, but assessment of this kind has been done with certain standards that consider only the American context. Latin America is a region with developing and undeveloped countries that have a complex way of life, work and development, and distinctive cultures. These components create a complicated environment that is ruled by political, cultural, authority, and legal structure systems that define it differently from the U.S.. Therefore, it is necessary to use a different approach when assessing readiness of Latin American participants to obtain accurate information vital for the success of any project involving distance leaning. The results of an assessment of this kind are important not only for the purpose of the projects, but also for the Latin American participants to be aware of their own readiness. The purpose of this study is to develop a set of guidelines and an instrument for assessing distance learning readiness of institutions in Latin America for international projects of food and agriculture with higher education institutions in the U.S.

The present study is part of the researcher's dissertation to obtain a Ph.D. degree.

The following is provided to you to decide whether you wish to participate in the present study:

- You will be asked to participate in a survey by e-mail.
- The survey will take no longer than 30 minutes total.
- The information retrieved will be analyzed and processed to obtain valuable information to determine your readiness for distance learning, and the usefulness of a culturally appropriate assessment instrument.
- Your participation in this study is requested on a voluntary basis and you may withdraw from the interview at any time.
- There are no risks in participating in the interview,
- If you choose to participate, you will be listed in a database in the animal biotechnology project Web site from Texas A&M University to be part of the animal biotechnology directory with a direct link to your Web Homepage, unless you request otherwise. You will also be entered in a drawing to win a digital camera on the last day set of the responses. The winner will be notified by e-mail and by telephone (if a telephone number is provided); the rest of the respondents will be also notified by e-mail about the results of the drawing. The digital camera will be sent by regular ground mail through USPS with no cost to the winner.
- The information you share will remain confidential.

By answering the questions in the interview, you are volunteering you participation.
If you would like additional information concerning this study before or after it is completed, please contact the investigator by e-mail or phone at: Patricia Villalobos, Department of Agricultural Education (AGED), Texas A&M University, pvillalobos@aged.tamu.edu, (979) 696-3007, Graduate Student, and/or Kim Dooley, AGED, Texas A&M University, k-dooley@tamu.edu, (979) 862-7180.

This research study has been reviewed and approved by the Institutional Review Board-Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Support Services, Office of Vice President for Research at (979) 845-8585 (mbuckley@tamu.edu).

Hoja de Información

Desarrollo de un proceso de valoración de la disposición al aprendizaje a distancia, culturalmente apropiado en Latinoamérica

En cualquier proyecto que incluya el aprendizaje a distancia es vital como primer paso la valoración de la disponibilidad y preparación de sus participantes (individuos e instituciones) para determinar la factibilidad del proyecto. La necesidad de los participantes, el nivel de inicio del proyecto y los métodos de enseñanza y aprendizaje para el desarrollo de un proyecto con excelencia, son algunos de los componentes a considerar. Las instituciones de educación superior Norte Americanas lo han llevado a cabo para el desarrollo de sus proyectos nacionales e internacionales, aunque estudios de este tipo se han llevado a cabo con ciertos estándares que consideran únicamente el contexto Norte Americano. Latinoamérica es una región con países en vías de desarrollo y en subdesarrollo, que tienen un sistema de vida, de trabajo y de desarrollo complejo, así como un sistema cultural distintivo. Estos factores crean un ambiente complejo regido por sistemas políticos, culturales, de autoridad y estructuras legales que los definen en forma diferente a los Estados Unidos de América. Por ello, es necesario el uso de métodos diferentes para la medición de la disponibilidad y preparación de los participantes latinoamericanos para la obtención de información certera y precisa que es vital para el éxito del cualquier proyecto que incluya el aprendizaje a distancia. Los resultados de una medición de este tipo son importantes no solo para los propósitos de los proyectos en si, pero también para que los participantes Latinoamericanos estén conscientes de su propia disponibilidad y preparación en el campo del aprendizaje a distancia. El propósito de este estudio es el desarrollo de un instrumento con su guía para la medición de la disposición y preparación de las instituciones de Latinoamérica en proyectos internacionales de las áreas agro biológicas con instituciones Norte Americanas de educación superior.

El presente estudio es parte de la tesis del investigador para obtener el grado de Doctora.

La información que se ofrece a continuación pretende orientar en la decisión para la participación en el presente estudio.

- Se le preguntará si desea participar vía correo electrónico.
- La encuesta no tardará más de 30 minutos.
- La información obtenida será analizada para obtener información valiosa sobre su disponibilidad y preparación en el aprendizaje a distancia, así como para demostrar la utilidad de un instrumento de valoración apropiado para los países Latinoamericanos.
- Su participación es voluntaria y puede abandonarla en cualquier momento sin consecuencia alguna.
- No existen riesgos en participar en ésta encuesta.
- Si usted elige participar será incluido en la base de datos del sitio de Internet del proyecto de Biotecnología Animal de la Universidad de Texas A&M, para formar parte del directorio de Biotecnología Animal en Latinoamérica con vínculo directo a su página de Internet, salvo que nos indique lo contrario. También entrará a una rifa de una cámara digital que será llevada a cabo el último día de recepción de respuestas de la encuesta. La persona ganadora será informada por correo electrónico y por teléfono (si un teléfono es proporcionado). Y el resto de los participantes también se les informará por correo electrónico. La cámara digital será enviada por correo, sin costo alguno para la persona ganadora.
- La información obtenida será confidencial.

Al contestar las preguntas en la entrevista, se asume su aceptación voluntaria como participante.

Si desea cualquier información adicional acerca de este estudio antes o después de ser completado, por favor contacte al responsable por correo electrónico o por teléfono a: Patricia Villalobos, Departamento de Educación Agrícola de la Universidad de Texas A&M, pvillalobos@aged.tamu.edu (979) 696 3007 y/o a la Dra. Kim Dooley, AGED, Universidad de Texas A&M, k-dooley@tamu.edu, (979) 862-7180.

Esta investigación ha sido revisada y aprobada por el Consejo Institucional de Examinación – Seres humanos como campo de investigación, de la Universidad de Texas A & M. Para problemas de tipo investigativo o dudas acerca de los derechos de los sujetos de investigación puede contactar al Consejo Institucional de Examinación con el Dr. Michael W. Buckley, Director de los servicios de apoyo, en la oficina del Vicepresidente de Investigación al teléfono: (979) 845 8585 (mwbuckley@tamu.edu).

APPENDIX E

SAMPLE FIRST E-MAIL CONTACT FOR POTENTIAL ANIMAL BIOTECHNOLOGY RESEARCHERS

(ENGLISH AND SPANISH)

Dear (Professional title) (Name and both last names),
Hello,

My name is Patricia Villalobos; I am studying a Ph.D. in Texas A&M University, USA, in the Department of Agricultural Education and part of my studies include the creation of a Directory of Animal Biotechnology Institutions and Researchers in Latin America. All areas of animal biotechnology are of our interest. The directory will be used as the population of a research study that will be part of the researcher's dissertation to obtain a Ph.D. degree. The purpose of this study is to develop an instrument for assessing distance learning readiness of institutions in Latin America for international projects of food and agriculture with higher education institutions in the U.S., making strong emphasis in cultural contexts.

Does your institution have animal biotechnology research? Are you dedicated to animal biotechnology?
If so, Can I consider you for the population of the study?
Could you help me providing information about institutions or researchers dedicated to animal biotechnology?
Sincerely
Patricia Villalobos
pvillalobos@aged.tamu.edu

Estimado (Título Profesional) (Nombre y Apellidos),
Buenos Días,
Mi nombre es Patricia Villalobos, estoy realizando estudios de doctorado en la Universidad de Texas A&M, Estados Unidos en el Departamento de Educación Agrícola y parte de mis estudios incluye la creación de un directorio de instituciones e investigadores de biotecnología animal en América Latina. Para los fines del estudio, todas las áreas de biotecnología animal son de nuestro interés. El estudio trata sobre cómo evaluar a los investigadores y a las instituciones de biotecnología animal en el área de educación a distancia, cuando son considerados para proyectos con instituciones de los Estados Unidos, haciendo un fuerte énfasis en los contextos culturales.
¿Su Institución incluye investigación en biotecnología animal? ¿Usted se dedica a la investigación en biotecnología animal?
De ser así ¿podría considerarlo para la población de mi estudio?
¿Podría usted ayudarme proporcionándome información sobre instituciones y/o investigadores dedicados a la biotecnología animal?
Atentamente
Patricia Villalobos
pvillalobos@aged.tamu.edu

APPENDIX F

REPLY E-MAIL TO RESEARCHER DEDICATED TO ANIMAL BIOTECHNOLOGY

(ENGLISH AND SPANISH)

Dear (Professional title) (Name and both last names),

Thank you for your prompt reply; it has been an honor including you in the directory. To create the directory, your complete name and e-mail address is needed, as well as the contact information of your research center (Address, telephone number, fax and Web page). Once the directory is completed, a random sample will be taken and an instrument will be delivered where distance education readiness of researchers is assessed, with a strong emphasis in the Latin American cultural context for projects with U.S. institutions. The purpose is the creation of an instrument that American institutions could use, which is adapted to our cultural context and will give accurate responses assuring continuity in the projects. The directory will be published in a Texas A&M Web page, and it will also be delivered to the directory institutions and researchers, as well as the study results. A data base will also be created and will be disseminated among academic and research institutions in the U.S..

Sincerely
Patricia Villalobos
pvillalobos@aged.tamu.edu

Estimado (Título Profesional) (Nombre y Apellidos)

Muchas gracias por su pronta respuesta, es un honor incluirlo en el directorio.
Para la creación del directorio requeriría de su nombre completo y el correo electrónico, la información de contacto de su centro de investigación (dirección, teléfonos, fax y página de Internet). Una vez completado el directorio se tomará una muestra para que se les distribuya un instrumento (cuestionario) donde se evalúa la preparación y disposición en el área de educación a distancia de los investigadores, dando un fuerte énfasis en el contexto cultural Latinoamericano, para proyectos con instituciones de los Estados Unidos. La intención es la creación de un instrumento (cuestionario) que utilicen las instituciones Americanas que se adecue a nuestro contexto cultural y el resultado de la evaluación sea veraz, asegurando así la continuidad en los proyectos. El directorio será publicado en una página de Internet de la Universidad de Texas A&M y se hará llegar a todas las instituciones de dicho directorio, así como también los resultados del estudio. También se creará una base de datos que se diseminará entre las instituciones académicas y de investigación de los Estados Unidos.

Atentamente
Patricia Villalobos
pvillalobos@aged.tamu.edu

APPENDIX G

REPLY E-MAIL TO RESEARCHER NOT DEDICATED TO ANIMAL BIOTECHNOLOGY

(ENGLISH AND SPANISH)

Dear (Professional title) (Name and both last names),
Thank you for your prompt reply and the valuable information you provided. It is a pity the study limits to animal biotechnology; it would have been an honor having you in the study.
Sincerely
Patricia Villalobos
pvillalobos@aged.tamu.edu

Estimado (Título Profesional) (Nombre y Apellidos)
Muchas gracias por su pronta respuesta y por la valiosa información proporcionada, es una lástima que mi estudio se limite al área de biotecnología animal, hubiera sido un honor incluirlo en la investigación.
Atentamente
Patricia Villalobos
pvillalobos@aged.tamu.edu

APPENDIX H

SAMPLE E-MAIL WITH INSTRUMENT ATTACHED

(ENGLISH AND SPANISH)

Dear (Professional title) (Name and both last names),
I want to thank you again for accepting to participate in the animal biotechnology study by answering the instrument attached in this e-mail.

- The survey will take no longer than 30 minutes total.
- The information retrieved will be analyzed and processed to obtain valuable information to determine your readiness for distance learning, and the usefulness of a culturally appropriate assessment instrument.
- Your participation in this study is requested on a voluntary basis and you may withdraw from the interview at any time.
- There are no risks in participating in the interview.
- The information you share will remain confidential.

Click on the attached document and save it; then open it and complete the questionnaire, when you are done save it again (This is a very important step to store your responses) and send it to my e-mail: pvillalobos@aged.tamu.edu
Thank you!

Estimado (Título Profesional) (Nombre y Apellidos),
Nuevamente le agradezco su aceptación a participar en el estudio de Biotecnología Animal a través de la contestación del cuestionario que se anexa como datos adjuntos.

- La encuesta no tardará más de 30 minutos.
- La información obtenida será analizada para obtener información valiosa sobre su disponibilidad y preparación en el aprendizaje a distancia, así como para demostrar la utilidad de un instrumento de valoración apropiado para los países Latinoamericanos.
- Su participación es voluntaria y puede abandonarla en cualquier momento sin consecuencia alguna.
- No existen riesgos en participar en ésta encuesta.
- La información obtenida será confidencial.

Haga clic en el documento adjunto y guárdelo, a continuación ábralo y conteste el cuestionario, al terminar, nuevamente guárdelo (Paso muy importante para almacenar sus respuestas) y envíelo de vuelta al correo: pvillalobos@aged.tamu.edu
¡Gracias!

APPENDIX I

INSTRUMENT

(ENGLISH AND SPANISH)

1	Do you have a personal computer?			
	At work?		At home?	
	☐ Yes	☐ No	☐ Yes	☐ No
	If not, Do you have access to a computer at work?			
	☐ Yes		☐ No	
2	What operating system does the computer have?			
	At work?		At home?	
	☐ Windows 98	☐ Windows ME	☐ Windows 98	☐ Windows ME
	☐ Windows XP	☐ Other	☐ Windows XP	☐ Other
	☐ Do not know		☐ Do not know	
3	What kind of Internet access connection do you have at work?			
	At work?		At home?	
	☐ Dial up	☐ Cable	☐ Dial up	☐ Cable
	☐ DSL	☐ Satellite	☐ DSL	☐ Satellite
	☐ Other	☐ Do not have...jump to question 5	Other	☐ Do not have...jump to question 5
4	How do you consider your Internet access connection?			
	At work?		At home?	
	☐ Fast	☐ Acceptable	☐ Fast	☐ Acceptable
	☐ Slow		☐ Slow	
	You have this kind of Internet connection at home because...			
	☐ Its availability	Its cost	☐ Its convinience	☐ Its speed ☐ Do not know
5	At work, how many computers per researchers are in the lab?			
	☐ One per researcher	☐ One for two researchers	☐ Other	
	☐ One for three	☐ One for the lab....Insert the number of researchers		
6	Do you consider the computers in the lab:			
	☐ outdated	☐ Common	☐ Up to date	☐ State of the art
7	Are the processors in the computers at work:			
	☐ Celeron (similar)	☐ Pentium 4 (similar)	☐ Later	
	☐ Pentium 1-3 (similar)	☐ Pentium D (similar)	☐ Do not know	
8	What do you use to store your information:			
	☐ Hard drive (C:/)		☐ Diskette	
	☐ Zip disks		☐ CD/DVD	
	☐ USB Flash Drive		☐ Other	
9	Your e-mail account is:			
	☐ Personal	☐ Shared at work	☐ Shared at home	
10	Do you have Internet technical support from work?			
	☐ Yes		☐ No,...Jump to question 13	
11	If yes, have you contacted them to solve any problem?			
	☐ Once	☐ Several times	☐ Constantly	☐ Never... Jump to question 13
12	How would you rate it?			
	☐ Very efficient	☐ Somewhat efficient	☐ Efficient	☐ Inefficient
13	Do you have a technical support department at work?			
	☐ Yes		☐ No	
14	If not, what do you use for technical support at work?			
	☐ Private computer expert		☐ A computer savvy co-worker	
	☐ Original computer service		☐ No one	
15	How often do you browse the Web?			
	☐ Rarely	☐ Once a month	☐ Once a week	
	☐ Several times a day	☐ Once a day	☐ Every other day	

16	What is the purpose for accessing the Internet?			
	☐ Work related	☐ General knowledge	☐ Personal	☐ E-mail
	☐ Shopping	☐ Research	☐ Chat	☐ Download programs, music etc..
17	Are you comfortable downloading software from the Internet and installing it on your computer?			
	☐ Yes		☐ No	
18	Do you go to Internet Cafés to access the Internet?			
	☐ Yes		☐ No	
	For the following questions, please choose the most appropriate answer among the choices given. Mark an "X" next to the most appropriate statement(s) that reflects your situation			
19	What is your comfort level with computers?			
☐	I can install and run applications and manage files, including cutting and pasting text from one file to another.			
☐	I sometimes need help to install and run applications and manage files.			
☐	I am not comfortable using a computer and need a great deal of help doing so for any reason.			
20	How do you feel when asked to learn to use some new software or other technology?			
☐	I usually look forward to learning something new and can teach myself and quickly master it.			
☐	I am usually apprehensive, but can eventually learn it.			
☐	I try to avoid it and can only learn it if someone can show me what to do.			
21	What is your level of experience with the Internet?			
☐	I can conduct research using the Internet and understand how to find, evaluate, and bookmark websites.			
☐	I have surfed the Internet for my personal use using a 'point and click' strategy.			
22	How comfortable are you doing important matters through e-mail and Internet?			
☐	I use e-mail and Internet for all my matters.			
☐	I use e-mail and Internet for everyday things and occasionally for delicate matters.			
☐	I have never use e-mail and/or Internet for important and delicate matters.			
23	At work, you communicate with co-workers, authorities, providers, etc...			
	☐ Through e-mail		☐ Face to face or by phone and fax.	
	☐ Through written documents		☐ Through written documents that must be sealed of received	
24	How would you describe your work?			
	☐ A full time career.		☐ A temporary job.	
	☐ An occupation I combine with other job for income reasons.		☐ An occupation I combine with other job to improve my research.	
25	If you need help performing a task on a computer you will:			
☐	Use available tutorials; seek assistance from a help desk or an instruction manual.			
☐	Ask a few people to show you before giving up.			
☐	Give up.			

26	Are you familiar with the following programs:						
Program	Yes	No	Use it			
			Every day	Weekly	Once a month	Occasionally
Power Point	☐	☐	☐	☐	☐	☐
Word	☐	☐	☐	☐	☐	☐
Excel	☐	☐	☐	☐	☐	☐
FrontPage	☐	☐	☐	☐	☐	☐
Producer	☐	☐	☐	☐	☐	☐
Flash	☐	☐	☐	☐	☐	☐
Dream Weaver	☐	☐	☐	☐	☐	☐
Authorware	☐	☐	☐	☐	☐	☐
Photoshop	☐	☐	☐	☐	☐	☐
Acrobat (.pdf)	☐	☐	☐	☐	☐	☐
Illustrator	☐	☐	☐	☐	☐	☐

27	Have you previously participated in a course delivered at a distance using technology? (that is, at a distance or online without going to class).	
	☐ Yes	☐ No... Jump to question 32

28	If yes, how was the course(s) delivered	
	☐ Video Tape	☐ Videoconference
	☐ CD-ROM	☐ Desk-top Video Conference
	☐ Internet (on line)	☐ Other.....Specify:

29	If it was online, what Learning Management System did you use?	
	☐ Was not online	☐ WebCT
	☐ Angel	☐ BlackBoard
	☐ Whiteboard	☐ First Class
	☐ Do not know	☐ Other.....Specify:

30	How did you participate?	31. How was your experience?				
		Bad	Poor	Fair	Good	Excellent
☐	I designed the course (Designer)	☐	☐	☐	☐	☐
☐	I gave support for the course (Authority)	☐	☐	☐	☐	☐
☐	I was a Teacher/Facilitator of the course.	☐	☐	☐	☐	☐
☐	I was a student in the course.	☐	☐	☐	☐	☐

32	For decisions regarding international projects...
☐	I have to contact the power structure.
☐	I have to take decisions through my immediate supervisor.
☐	I take the decisions and inform authorities later.
☐	I take decisions with my authorities.
☐	I do not take decisions.

33	International projects
☐	Are part of my institution
☐	Are rare in my institution
☐	Do not exist in my institution
☐	Are too complicated to develop through the decision making process in my institution

34	Have you ever created a Web page?	
	☐ Yes	☐ No

35	For an academic exchange that requires an internship in another country, what is the time period considered appropriate for you considering other factors such as your current job or jobs, family, etc:		
☐	Weeks	How many?	
☐	Months	How many?	
☐	Years	How many?	
☐	Other	Explain	
36	If you are involved in an international project that requires a internship in another country you would:		
☐	Move with your family		
☐	Move by yourself		
☐	Pass the opportunity to a colleague		
☐	Expect your institution to send the person they consider appropriate for the institution's interests.		
37	Have you ever created media to place it in the Internet (audio files, video files, text, worksheets, photographs slides, etc.)?		
	☐ Yes	☐ No	
38	Does your institution have a membership with any learning management system in the market?		
	☐ Yes	☐ No... Jump to question 40	☐ I do not know
39	If yes, Does your institution have a membership with any learning management system in the market?		
	☐ WebCT	☐ Black Board	
	☐ Angel	☐ Whiteboard	
	☐ Other....specific:	☐ Do not know	
40	Does your department have access to the Learning Management System?		
	☐ Yes	☐ No	☐ Do not know
41	Do you have to go through a complicated system of authorization and Web experts to develop a course and uploaded in the Web?		
	☐ Do not know	☐ Yes	☐ No
42	Do you consider your institution to be equipped in computer technology, such as hardware, software, printers, scanners, video, audio, etc.		
	☐ Very much Equipped	☐ Equipped	
	☐ Somewhat Equipped	☐ Just the Essential	
	☐ The minimum required	☐ Not at all	
43	Does your department have access to the equipment?		
	☐ Yes	☐ No	☐ Do not know

The following statements refer to the delivery of a course. Please mark:						
Strongly Disagree (SD)		Disagree (D)	Agree (A)	Strongly Agree (SA)		
				SD	D	A	SA
44	Having classmates from all over the country and around the world is a wonderful educational opportunity in itself			☐	☐	☐	☐
45	I am comfortable communicating in writing.			☐	☐	☐	☐
46	I think increased learning will take place through sharing my work, life, and educational experiences as part of the learning process.			☐	☐	☐	☐
47	I am familiar with the concepts of adult education.			☐	☐	☐	☐
48	I have experience in instructional design.			☐	☐	☐	☐
49	I think cultural differences among different countries can be a barrier for scientific information exchange.			☐	☐	☐	☐
50	I subscribe to the value of introducing critical thinking into the learning process			☐	☐	☐	☐
51	I consider distance learning is the same as face to face education.			☐	☐	☐	☐
52	An academic degree obtain online is equivalent to one obtain from traditional delivery.			☐	☐	☐	☐
53	I would be able to participate in an international academic exchange, where I get to spend time in another country.			☐	☐	☐	☐
The following section Hill measure you English proficiency. It is written in English on purpose, if you do not feel comfortable reading in English, jump to question 67.							
The following statements refer to English proficiency, and it is intentionally in English. Please mark:							
Strongly Disagree (SD)		Disagree (D)	Agree (A)	Strongly Agree (SA)		
				SD	D	A	SA
54	I think language can be a barrier for scientific information exchange.			☐	☐	☐	☐
55	I can read in English without the need of a dictionary.			☐	☐	☐	☐
56	I read many articles in English.			☐	☐	☐	☐
57	I can communicate in English when I travel.			☐	☐	☐	☐
58	I can speak in English about my work fluently.			☐	☐	☐	☐
59	I can't speak technical English.			☐	☐	☐	☐
60	I can understand a native English speaker in a conference.			☐	☐	☐	☐
61	I am comfortable Surfing the web in English.			☐	☐	☐	☐
62	I write articles in English.			☐	☐	☐	☐
63	I have to translate English to Spanish to be able to comprehend.			☐	☐	☐	☐
64	I require English as a Second Language courses.			☐	☐	☐	☐
65	I avoid articles, Web pages and documents in English.			☐	☐	☐	☐

66	Adult education is in a period of transformation. This transformation can be traced to the use of technology in learning which is forcing educators to review 'what they do and how they do it.'	☐	☐	☐	☐
67	I rather not answer the English section			☐	

Thank you very much for your valuable information!

Please save this document and send it to the following e-mail:

pvillalobos@aged.tamu.edu

I thank you again for your significant participation
Sincerely
Patricia Villalobos
Ph.D. Student
Texas A&M University
Department of Agricultural Education

By answering the questions in the interview, you are volunteering your participation.

If you would like additional information concerning this study before or after it is completed, please contact the investigator by e-mail or phone at: Patricia Villalobos, Department of Agricultural Education (AGED), Texas A&M University, pvillalobos@aged.tamu.edu, (979) 696-3007, Graduate Student, and/or Kim Dooley, AGED, Texas A&M University, k-dooley@tamu.edu, (979) 862-7180.

This research study has been reviewed and approved by the Institutional Review Board-Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Support Services, Office of Vice President for Research at (979) 845-8585 (mbuckley@tamu.edu).

1	¿Tienes una computadora personal?			
	¿En el trabajo?		¿En casa?	
	☐ Si	☐ No	☐ Si	☐ No
	Si No, ¿Tienes acceso a una computadora en el trabajo?			
	☐ Si		☐ No	
2	¿Qué sistema operativo tiene la computadora?			
	¿En el trabajo?		¿En casa?	
	☐ Windows 98	☐ Windows ME	☐ Windows 98	☐ Windows ME
	☐ Windows XP	☐ Otro	☐ Windows XP	☐ Otro
	☐ No se		☐ No se	
3	¿Qué tipo de conexión de acceso a Internet utilizas?			
	¿En el trabajo?		¿En casa?	
	☐ Dial up	☐ Cable	☐ Dial up	☐ Cable
	☐ DSL	☐ Satelite	☐ DSL	☐ Satelite
	☐ Otra	☐ No tengo…Salta a la pregunta 5	☐ Otra	☐ No tengo…Salta a la pregunta 5
4	¿Cómo consideras la conexión a Internet que utilizas?			
	¿En el trabajo?		¿En casa?	
	☐ Rápida	☐ Aceptable	☐ Rápida	☐ Aceptable
	☐ Lenta		☐ Lenta	
	¿Tienes este tipo de conexión en casa por :			
	☐ La disposición	☐ El costo	☐ La conveniencia	☐ La velocidad ☐ No sé
5	En el trabajo ¿Cuántas computadoras por investigador hay en el laboratorio?			
	☐ Una por Investigador	☐ Una por dos investigadores	☐ Otra	
	☐ Una para tres	☐ Una para el laboratorio….Inserte el numero		
6	Consideras que las computadoras del laboratorio:			
	☐ Son obsoletas	☐ Son comunes	☐ Están al día	☐ Son tecnología de punta
7	Los procesadores de las computadoras del trabajo son:			
	☐ Celeron (similar)	☐ Pentium 4 (similar)	☐ Más recientes	
	☐ Pentium 1-3 (similar)	☐ Pentium D (similar)	☐ No se	
8	¿Qué utilizas para almacenar tu información?			
	☐ Disco duro (C:/)		☐ Disquetes	
	☐ Discos Zip		☐ CD/DVD	
	☐ USB Flash Drive		☐ Otra	
9	Tu correo electrónico es:			
	☐ Personal	☐ Compartido en el trabajo	☐ Compartido en casa	
10	¿Tienes personal de soporte técnico para Internet en el trabajo?			
	☐ Si		☐ No,…Salta a la pregunta 13	
11	Si es afirmativo ¿Los has contactado para resolver algún problema?			
	☐ Una vez	☐ Varias veces	☐ Constantemente	☐ Nunca…Salta a la pregunta 13
12	¿Cómo los calificarías?			
	☐ Muy eficientes	☐ Medio eficientes	☐ Eficientes	☐ Ineficientes
13	¿Tienes un departamento de soporte técnico en el trabajo?			
	☐ Si		☐ No	
14	Si no, ¿A quién recurres para soporte técnico en el trabajo?			
	☐ Un experto en computación privado		☐ Un compañero experto en computadoras	
	☐ El servicio original de las computadoras		☐ A nadie	
15	¿Qué tan a menudo utilizas el Internet?			
	☐ Rara vez	☐ Una vez al mes	☐ Una vez a la semana	
	☐ Varias veces al día	☐ Una vez al día	☐ Cada tercer día	

16	¿Con qué objetivo utilizas el Internet?			
	☐ Relacionado con el trabajo	☐ Conocimientos generales	☐ Personal	☐ Correo electrónico
	☐ Compras	☐ Investigacion	☐ Chatear	☐ Bajar programas, musica, etc.
17	¿Bajas programas del Internet para instalarlos en tu computadora?			
	☐ Si		☐ No	
18	¿Vas a cafés Internet a accesar la Web?			
	☐ Si		☐ No	
	Para las siguientes preguntas, por favor selecciona la respuesta más apropiada. Marca la oración que más refleje tu situación.			
19	¿Qué tan seguro te sientes trabajando en una computadora?			
☐	Puedo instalar y correr aplicaciones y manejar archivos, incluyendo cortar y pegar texto de un documento a otro.			
☐	A veces necesito ayuda para instalar y correr las aplicaciones, así como para manejar archivos.			
☐	No me siento seguro usando una computadora y requiero de mucha ayuda para hacerlo.			
20	¿Cómo te sientes cuando te piden que aprendas a usar un nuevo programa o tecnología?			
☐	Normalmente busco aprender cosas nuevas, aprendo solo/a y lo domino rápidamente.			
☐	Soy aprensivo/a, pero eventualmente lo puedo aprender.			
☐	Trato de evitarlo y solo lo aprendo si alguien me enseña como hacerlo.			
21	¿Cuál es tu nivel de experiencia con el Internet?			
☐	Conduzco búsquedas de investigación en Internet y entiendo cómo encontrar, evaluar y marcar una página Web.			
☐	Acceso a Internet para cuestiones personales, utilizando una estrategia aleatoria.			
22	¿Confías en el correo electrónico e Internet para desarrollar asuntos importantes de trabajo?			
☐	Utilizo el correo electrónico e Internet para todos mis asuntos.			
☐	Uso el Internet y el correo electronico todos los días y ocasionalmente para cuestiones delicadas			
☐	Nunca utilizo Internet o correo electronico para cuestiones importantes o delicadas.			
23	En el trabajo, para cuestiones técnicas, te comunicas con compañeros, jefes, proveedores, etc. principalmente...			
	☐ A través de correo electrónico		☐ En persona, por teléfono o fax.	
	☐ A través de documentos escritos		☐ A través de documentos escritos con sello de recibido	
24	¿Cómo describirías tu trabajo?			
	☐ Una carrera de tiempo completo		☐ Un trabajo temporal	
	☐ Una ocupacion que combino con otras por cuestiones económicas,		☐ Una ocupacion que combino con otras para mejorar mi investigación	
25	Si requieres ayuda para realizar alguna cosa en la computadora, tu...			
☐	Usaría tutoriales o el instructivo.			
☐	Le preguntaría a diferentess personas antes de darme por vencido.			
☐	Me daría por vencido.			

26	¿Te son familiares los siguientes programas?						
Programa	Si	No	Lo usas			
			Diariamente	Semanalmente	Una vez al mes	Ocasionalmente
Power Point	☐	☐	☐	☐	☐	☐
Word	☐	☐	☐	☐	☐	☐
Excel	☐	☐	☐	☐	☐	☐
FrontPage	☐	☐	☐	☐	☐	☐
Producer	☐	☐	☐	☐	☐	☐
Flash	☐	☐	☐	☐	☐	☐
Dream Weaver	☐	☐	☐	☐	☐	☐
Authorware	☐	☐	☐	☐	☐	☐
Photoshop	☐	☐	☐	☐	☐	☐
Acrobat (.pdf)	☐	☐	☐	☐	☐	☐
Illustrator	☐	☐	☐	☐	☐	☐

27	¿Has participado alguna vez en un curso a distancia con apoyo de tecnología? (es decir, a distancia o en línea sin asistir a clases presenciales).
☐ Si	☐ No.. Salta a la pregunta 32

28	Si es afirmativo ¿cómo fue impartido el curso?
☐ Por video	☐ Por videoconferencia
☐ Por CDROM	☐ Por videoconferencia de escritorio
☐ Por Internet(en línea)	☐ Otra.....Especifica:

29	Si fue en línea ¿qué Sistema de Administración del Aprendizaje (plataforma) fue utilizado?
☐ No fue en línea	☐ WebCT
☐ Angel	☐ BlackBoard
☐ Whiteboard	☐ FirstClass
☐ No se	☐ Otra.....Especifica:

30	¿Cómo participaste?	31.	¿Cómo fue tu experiencia?				
			Mala	Pobre	Regular	Buena	Excelente
☐	Diseñe el curso(Diseñador/a)		☐	☐	☐	☐	☐
☐	Apoye el curso(Autoridad)		☐	☐	☐	☐	☐
☐	Fui profesor(a)/facilitador(a)		☐	☐	☐	☐	☐
☐	Fui estudiante		☐	☐	☐	☐	☐

32	Para decisiones con respecto a proyectos internacionales...
☐	Debo contactar a la estructura de poder.
☐	Debo tomar las decisiones a través de mi supervisor inmediato.
☐	Tomo las decisiones y después informo a las autoridades.
☐	Se toman las decisiones en conjunto con las autoridades.
☐	Yo no tomo esta clase de decisiones.
33	Los proyectos internacionales
☐	Son parte de mi institución
☐	Son raros en mi institución.
☐	No existen en mi institución.
☐	Son muy complicados para desarrollar debido al proceso de tomas de decisiones de mi institución.
34	¿Has creado alguna página Web?
	☐ Si ☐ No

35	Si te ofrecieran un intercambio académico, que requiriera de una estancia en otro país, ¿Cuál sería el tiempo apropiado para ti, considerando factores como trabajo/s, familia, etc.?		
☐	Semanas	¿Cuántas?	
☐	Meses	¿Cuantas?	
☐	Años	¿Cuantas?	
☐	Otra	Explique:	
36	Si estuvieras involucrado en un proyecto internacional que requiriera de una estancia en otro país ¿qué harías?		
☐	Mudarme con la familia		
☐	Mudarme solo.		
☐	Pasar la oportunidad a otro colega		
☐	No esperar ser seleccionado por que la institucion asignara a otra persona apropiada a sus intereses políticos.		
37	¿Has creado alguna pieza digital para ser instalada en Internet (archivos de audio, de video, hojas de trabajo, fotografías, etc.?		
	☐ Si	☐ No	
38	¿Tiene tu institución alguna membresía con algún Sistema de Administración del Aprendizaje (plataforma) comercial?		
	☐ Si	☐ No…salta a la pregunta 40	
39	En caso afirmativo ¿qué Sistema de Administración del Aprendizaje (plataforma) maneja tu institución?		
	☐ WebCT	☐ BlackBoard	
	☐ Angel	☐ Whiteboard	
	☐ Otra…especifica:	☐ No se	
40	¿Tu departamento tiene acceso a un Sistema de Administración del Aprendizaje (plataforma)?		
	☐ Si	☐ No	☐ No sé
41	¿Debes pasar por un sistema de autorizaciones complicado y por expertos de la Web para desarrollar y colocar un curso en Internet?		
	☐ No sé	☐ Si	☐ No
42	¿Consideras que tu institución está equipada con tecnologías de la computación, tales como hardware, software, impresoras, escáner, video, audio, etc.?		
	☐ Muy equipada	☐ Equipada	
	☐ Medio equipada	☐ Lo esencial	
	☐ Lo mínimo requerido	☐ muy poco/ ni el mínimo	
43	¿Tu departamento tiene acceso al equipo?		
	☐ Si	☐ No	☐ No sé

Los siguientes enunciados se refieren a la impartición de cursos, por favor marca las apropiadas:							
Fuertemente en Desacuerdo (FD)		Desacuerdo (D)		Coincido (C)		Coincido Fuertemente (CF)	
		FD	D	C	CF		
44	Tener compañeros de todo el país y de otras partes del mundo es una maravillosa oportunidad educativo *per se*.	☐	☐	☐	☐		
45	Me siento cómodo al comunicarme por escrito.	☐	☐	☐	☐		
46	Creo que el aprendizaje se incrementa al compartir mi trabajo, vida y experiencias educativas, como parte del proceso de aprendizaje.	☐	☐	☐	☐		
47	Estoy familiarizado con los conceptos de la educación para el estudiante adulto.	☐	☐	☐	☐		
48	Tengo experiencia en el Diseño Instruccional.	☐	☐	☐	☐		
49	Creo que las diferencias culturales entre países pueden ser una barrera para el intercambio de información científica.	☐	☐	☐	☐		
50	Apoyo el concepto de la introducción del pensamiento crítico en el proceso enseñanza-aprendizaje.	☐	☐	☐	☐		
51	Creo que la educación a distancia está al mismo nivel que la educación presencial.	☐	☐	☐	☐		
52	Un grado académico obtenido por cursos a distancia o en línea, tiene la misma equivalencia académica que uno obtenido por clases tradicionales presenciales.	☐	☐	☐	☐		
53	Puedo participar en un intercambio académico donde viviría un tiempo determinado en el extranjero.	☐	☐	☐	☐		

La siguiente sección medirá tu competencia en el idioma inglés. Se escribió en inglés a propósito, pero si no te sientes cómodo leyendo el inglés, salta a la última pregunta, la 67.

The following statements refer to English proficiency, and it is intentionally in English. Please mark:							
Strongly Disagree (SD)		Disagree (D)		Agree (A)		Strongly Agree (SA)	
		SD	D	A	SA		
54	I think language can be a barrier for scientific information exchange.	☐	☐	☐	☐		
55	I can read in English without the need of a dictionary.	☐	☐	☐	☐		
56	I read many articles in English.	☐	☐	☐	☐		
57	I can communicate in English when I travel.	☐	☐	☐	☐		
58	I can speak in English about my work fluently.	☐	☐	☐	☐		
59	I can't speak technical English.	☐	☐	☐	☐		
60	I can understand a native English speaker in a conference.	☐	☐	☐	☐		
61	I am comfortable Surfing the web in English.	☐	☐	☐	☐		
62	I write articles in English.	☐	☐	☐	☐		
63	I have to translate English to Spanish to be able to comprehend.	☐	☐	☐	☐		
64	I require English as a Second Language courses.	☐	☐	☐	☐		
65	I avoid articles, Web pages and documents in English.	☐	☐	☐	☐		
66	Adult education is in a period of transformation. This transformation can be traced to the use of technology in learning	☐	☐	☐	☐		

	which is forcing educators to review 'what they do and how they do it.'				
67	Prefiero no contestar el cuestionario en inglés	☐			

¡Gracias por tu valiosa información!

Por favor guarda el documento y mándalo como adjunto en un correo electrónico a:

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Agradezco nuevamente tu participación

Atentamente
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Al contestar las preguntas en la entrevista, se asume tu aceptación voluntaria como participante.

Si deseas cualquier información adicional acerca de este estudio antes o después de ser completado, por favor contacta al responsable por correo electrónico o por teléfono a: Patricia Villalobos, Departamento de Educación Agrícola de la Universidad de Texas A&M, pvillalobos@aged.tamu.edu (979) 696 3007 y/o a la Dra. Kim Dooley, AGED, Universidad de Texas A&M, k-dooley@tamu.edu, (979) 862-7180.

Esta investigación ha sido revisada y aprobada por el Consejo Institucional de Examinación – Seres humanos como campo de investigación, de la Universidad de Texas A & M. Para problemas de tipo investigativo o dudas acerca de los derechos de los sujetos de investigación puedes contactar al Consejo Institucional de Examinación con el Dr. Michael W. Buckley, Director de los servicios de apoyo, en la oficina del Vicepresidente de Investigación al teléfono: (979) 845 8585 (mwbuckley@tamu.edu).

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